egates should possess all information presented to the committee, he assumed there was no objection to its being circulated.

The chairman said he feared it would not be possible to get all these reports circulated in time to be examined and discussed that afternoon, and if it was thought best the committee might adjourn until the next morning.

Accordingly, the meeting was adjourned until Saturday, January 7, 1922, at 11 o'clock a.m.

SEVENTEENTH MEETING—SATURDAY, JANUARY 7, 1922, 11 A.M.

PRESENT.

United States.—Mr. Hughes, Senator Lodge, Mr. Root, Senator Underwood, Col. Roosevelt, Admiral Coontz. Accompanied by Mr. Wright, Mr. Clark.

British Empire.—Mr. Balfour, Lord Lee, Sir Auckland Geddes, Rear Admiral Sir E. Chatfield, Sir Robert Borden (for Canada), Senator Pearce (for Australia). Accompanied by Sir Maurice Hankey, Capt. Domville, Mr. Mousley, Col. Day, Mr. Flint.

France.—Mr. Sarraut, Mr. Jusserand, Vice Admiral de Bon. Accompanied by Mr. Kammerer, Mr. Denaint, Capt. Odend'hal. Mr. Pensot.

Italy.—Senator Schanz, Senator Albertini, Vice Admiral Baron Acton. Accompanied by Marquis Visconti-Venosta, Count Pagliano, Col. Asinari di Bernezzo.

Japan.—Admiral Baron Kato, Prince Tokugawa, Vice Admiral Kato, Capt. Uyeda. Accompanied by Mr. Ichihashi, Mr. Shira-tori, Mr. Sugimura.

The secretary general. Assisted by Mr. Cresson and Mr. Osborne. Mr. Camerlynck, interpreter.

1. The seventeenth meeting of the Committee on the Limitation of Armament was held in the Columbus Room of the Pan American Union Building on Saturday, January 7, 1922, at 11 a.m.

2. There were present: For the United States, Mr. Hughes, Senator Lodge, Mr. Root, Senator Underwood, Col. Roosevelt, Admiral Coontz; for the British Empire, Mr. Balfour, Lord Lee, Sir Auckland Geddes, Rear Admiral Sir E. Chatfield, Sir Robert Borden (for Canada), Senator Pearce (for Australia); for France, Mr. Sarraut, Mr. Jusserand, Vice Admiral de Bon; for Italy, Senator Schanz, Senator Albertini, Vice Admiral Acton; for Japan, Admiral Baron Kato, Prince Tokugawa, Vice Admiral Kato, Capt. Uyeda.

3. Secretaries and technical advisors were present as follows: For the United States, Mr. Wright, Mr. Clark; for the British
Empire, Sir Maurice Hankey, Capt. Domville, Mr. Mousley, Col.
Day, Mr. Flint; for France, Mr. Kammerer, Mr. Denaint, Capt.
Odenbach, Mr. Ponsot; for Italy, Marquis Visconti-Venosta,
Count Pagliano, Col. Asinari di Bernezzo; for Japan, Mr. Ichi-
hashi, Mr. Shiratori, Mr. Sugimura. The secretary general, as-
sisted by Mr. Cresson and Mr. Osborne, was present. Mr. Cam-
erlynck was present as interpreter.

The chairman, Mr. Hughes, at the opening of the meeting, rec-
gnized Prince Tokugawa.

Prince Tokugawa said that it was for an unpleasant purpose
that he arose to say a word. As some of the committee already
knew, he was about to take his leave of the conference; he was
starting that afternoon on his return journey to Tokyo to re-
sume his responsibilities in Parliament, which had already con-
vened.

It was needless for him to say how greatly he appreciated the
courtesies which had been accorded to him by all the delegates
and for their cooperation in the work of the conference. That
work had already achieved remarkable success and, as was
known, its full list of accomplishments was not yet completed.

In bidding to the members of the committee adieu, he wished
to say that he would always remember with gratification and
pride the unique privilege which he had had of sitting with them
and would be delighted whenever their and his paths might cross
again.

The chairman said he was sure the members of the committee
would all deeply regret that Prince Tokugawa had to leave them.
They were indebted to him for his cooperation and he might be
assured of their abiding affection and esteem. He was leaving
the most pleasant memories of his association with them in this
important work and the contribution that he had made personally
to the success of their efforts.

The chairman then suggested that the committee proceed with
the consideration of the resolution which had been presented with
respect to the abolition of the use of asphyxiating and other
poisonous gases in warfare. He then read the resolution, as
follows:

"The use in war of asphyxiating, poisonous, or other gases
and all analogous liquids, materials, or devices having been justly
condemned by the general opinion of the civilized world and a
prohibition of such use having been declared in treaties to which
a majority of the civilized powers are parties;

"Now, to the end that this prohibition shall be universally ac-
cepted as a part of international law binding alike the conscience
and practice of nations, the signatory powers declare their assent
to such prohibition, agree to be bound thereby between them-
selves, and invite all other civilized nations to adhere thereto."
Mr. Sarraut said he rose to express his full and frank adherence to Mr. Root’s resolution. From the first France had condemned the barbarous inventions and the abominable practices introduced by Germany in the late war and the new methods consisting in the use of gases, burning liquids, and poisonous substances; the first thing the committee should do was officially and solemnly to denounce those who had taken the initiative in these things. All present should hope and work for the final disappearance from warfare of these infamous practices if, indeed, other wars were to come—a thought which, he said, was abhorrent to him.

This might, no doubt, be accomplished by setting an example to the other countries. The reports of experts who had maturely considered the question had indeed pointed out the extreme difficulty, if not impossibility, of taking practical precautions against the threat and the use of these poison gases and these chemicals. It was an established and indisputable fact that those chemicals which were used in the manufacture of gases and poisons were the same that were used for innumerable ordinary substances necessary to the industrial and peaceful life of the human race.

The reports of experts had established the impossibility of exercising an effective supervision over the production of gases which might be used as weapons of war and hence the impossibility of preventing or limiting such production. This entailed, as a logical consequence, the impossibility of preventing any country from arming itself in advance against the unfair use of those gases which an unscrupulous enemy might secretly prepare for sudden use upon an unprotected enemy, as had been done during the late war.

But, if the exercise of authority in the matter did not at the moment appear practicable, the Root resolution was none the less a useful accomplishment because, in the first place, it would be a bond of union between the Powers here represented and, further, because their agreement and their example might be such as to bring about the adherence of all the nations to the same principles. It was necessary, indeed, that this adherence should be unanimous in order that an effective and salutary result might be obtained. But, in the meantime, the conference would have presented a great example possessing a not inconsiderable persuasive power, thus possibly preventing the repetition of certain atrocities committed by certain belligerents during the late war. It was with this lofty and humane motive that the French delegation subscribed with all its heart to the Root resolution.

Mr. Balfour said that as he understood the matter, the proposal before the meeting was the reaffirmation of the admitted principles of international law. In that sense there was nothing new in the proposals made by Mr. Root. Indeed, on the very
face of the document itself, it was pointed out that the greater number of nations, in the various treaties which they had made subsequent to the armistice, had explicitly or implicitly declared that, in their view, the present proposal was already part of the accepted law of nations. He believed that the United States of America, who had not ratified those treaties, had made separate treaties; but in those treaties also they had by implication affirmed the present proposal as part of the general law. Moreover, he remembered that in March, 1918, a declaration had been made by all the allied and associated powers, in response to an appeal made to them by the Red Cross Society, in which in explicit terms they had laid down the same doctrine. Behind all those formal acts there had been the findings of the two Hague conferences which, although so far as he was aware were not ratified by the United States of America, were accepted by all the other powers engaged in those conferences, undoubtedly with the sympathy although not with the explicit ratification of America. Therefore, he supposed he was right in saying that the document before them neither made nor professed to make any change in international law.

It would be interesting to compare the procedure on this point with that which had been adopted with regard to submarines. There also they had declared in very clear terms what they conceive to be the law, and what undoubtedly was the law of nations as regards attacks on merchant ships by ships of war. In that case they went further than it was now proposed to do, and further than it was possible to go now, for they had made an alteration and had proposed an extension of the law of nations. They had agreed among themselves to be bound by regulations which were in advance of the actual law of nations; and they had also altered the sanctions which lay behind the law of nations, in that they introduced the fourth of Mr. Root's clauses which would convict the individuals who broke the law as guilty of piracy. So that in dealing with submarines they had gone a good deal further than was practicable in the present case. They could now do no more than reaffirm the law. It might be asked in the first case what was the use of merely coming forward and reaffirming what nobody denied? Personally he thought such a course was important and valuable, if all the lamentable occurrences of the late war and all the developments which that war caused in the use of noxious gases were taken into account.

Of course, they must all admit, as Mr. Sarraut had well pointed out, that a mere affirmation of the law without adding any sanctions to it would not relieve the nations of the world from taking precautions against those who were prepared to break the law; and who, if they were allowed to do so with impunity, might dominate the world by the mere indifference they showed to the laws
which the world had endeavored to lay down. That was what had actually occurred in 1915. In 1915, as in 1922, the present proposal was the law of nations; and, because it was the law of nations, no nation but one had taken any steps toward using noxious gases, or had contemplated as part of their possible military operation that such gases should be used either by themselves or by their enemies. The result had been very near to a complete disaster for the Allied armies. The shock of that new weapon of warfare had been wholly local, for the invention of science came to the rescue, and finally the Allies and their unscrupulous enemy fought out the war on equal terms. That example unhappily was now before them and could not be ignored. Their specialists had pointed out in Washington, and an examination by a committee of the League of Nations had brought out a similar result at Geneva, that it was perfectly impossible so to arrange matters that a nation bent upon doing so should not in times of peace—whatever the rules of war might be—make such preparations as would enable it to use that monstrous and inhuman method of warfare at its will if war broke out. They knew that at least one great civilized nation had not thought it improper, or at all events had chosen, whether proper or not, to break the law of nations. That wretched example might unhappily be followed in the future; and therefore no nation could forget that it was open to attack by unscrupulous enemies; no nation therefore could forego that duty of examining how such attacks could be properly dealt with and effectively met.

Again there was a parallel in the case of the submarine. The British Empire delegation had desired to abolish submarines, but that was found impossible, and it was admittedly impossible to stop the erection of works in which poison gases could be manufactured in unlimited quantities. The British Empire delegation therefore had to say—and he was sure they had the sympathy around that table, for no dissentient voice had been raised—that if submarines were allowed they had to contemplate as a conceivable possibility that they would be misused, and that precautions would have to be taken against such misuse. He believed that every other nation recognized that unhappily submarines would remain a necessity as in the case of poison and lethal gases. Therefore the relief which such a resolution as this would give to the world in connection with poison gas would not be the complete relief which they all desired; it would not remove the anxieties and preoccupations which the possible use of gas necessarily involves. But were they therefore to say that they would do nothing? Were they therefore to say that resolutions such as that now before them were useless? Were they therefore to say that it was an empty form solemnly to repeat rules which were already accepted,
although they were not in a position by the establishment of new sanctions absolutely to prevent their use by any nation unscrupulous enough to desire to use them? Those questions he would answer in the negative. He believed that if by any action of theirs on such an occasion as the present they could do something to bring home to the consciences of mankind that poison gas was not a form of warfare which civilized nations could tolerate, they would be doing something important toward discouraging them.

No sanctions were provided in the present document; no sanctions could be provided there. But if anyone looked back even upon the history of the late lamentable war, he would see, notably in the great test case of the United States, that the gradual rising of public indignation against some grossly immoral use of the weapons of war had had a profound influence upon the history of the world. He was quite sure that the moral indignation roused in the consciences of the United States had had a most powerful effect upon the whole trend of events. He thought that by the present resolution, backed as it was by the consciences of the civilized world, although there was no sanction laid down in it, for no sanction was possible, they would in fact be creating a sanction not formally but informally. He believed that the outraged consciences of the world would rise in indignation and that any nation would be very bold and very ill-advised, if, in the face of that universal opinion, it deliberately violated the rules which on the present occasion they were invited deliberately to affirm. Therefore, without committing himself to the actual language of the resolution, he most heartily associated himself and also the British Empire delegation with the policy which the American delegation, through the mouth of Mr. Root, had put forward for their acceptance.

Admiral Baron Kato said that the question of poison gases had been discussed fully and the opinions in regard to them were now very well known. He would not, therefore, take the committee's time by repeating them; he simply wished to express his approval, on behalf of the Japanese delegation, of the resolution presented by Mr. Root.

The chairman remarked that there seemed to be unanimity in support of the resolution and added that, unless further discussion was desired, he would ask for the formal assent of the delegations to the resolution in the form in which he had read it.

The delegations being polled, each voted affirmatively, and the chairman declared it unanimously adopted.

The chairman said that the next subject presented for the committee's consideration was the question of limitation of aircraft as to numbers, character, and use.

It would be recalled that a subcommittee of experts to deal with this subject had been appointed; that committee had made a
careful, comprehensive, and somewhat voluminous report, which had been distributed. In view of the fact that the members of the committee all had this report before them, he assumed that it would not be necessary to read it in extenso. The question, he continued, was not presented for discussion; the desire was simply to get the report before the committee for such disposition as they might desire; and in order that they might make a beginning, he would simply refer to some of the main points of the report. Whatever time was necessary for its full examination and analysis would, of course, be afforded; it was not necessary that the committee should proceed with the discussion of it, which would not be continued until all the members of the committee were agreeable to that course.

Sir Robert Borden said that he would be grateful if the chairman would make as full an exposition of the report on the limitation of aircraft as he was prepared to do. This would serve as an introduction of the principal issues and would facilitate the general understanding.

The chairman then briefly outlined, and read extracts from, the following report:

"COMMITTEE ON AIRCRAFT—REPORT ON LIMITATION OF AIRCRAFT AS TO NUMBERS, CHARACTER, AND USE.

1. Form of procedure.—In considering the limitation of aircraft as to numbers, character, and use, the Committee on Aircraft adopted a form of procedure which took up the various questions involved in the following order: (1) Commercial aircraft; (2) civil aircraft; (3) military aircraft. Heavier-than-air and lighter-than-air craft were considered separately, since the conditions governing the two are not in all cases the same. An effort was made to determine whether or not it is possible to impose limitations upon their (1) number, (2) character, (3) use, and after discussion of the methods that might be employed to effect such limitation, whether limitation was practicable or not. This committee feels that the desirability of placing any limitations whatever upon aircraft is a matter of policy, one which it is for the main committee itself to determine. Nevertheless, it feels it to be a duty to point out the essential facts which will have a decided bearing upon the determination of the proper policy to be adopted, and this is done in this report.

2. Commercial aircraft.—Different methods of imposing such limitation may be adopted by different states. The precise methods adopted by any state must be in conformity with its organic law. In some states it may be possible to impose an arbitrary limitation; in others, by the exercise of the police power, or of the power to tax, a practical limitation may be enforced.
In the United States, where laws passed by the Congress must conform to the written Constitution of the country, there may be some difficulty in finding an effective means of imposing this limitation, but nevertheless it is believed that if necessary such means can be found.

"3. Before discussing any other phase of the matter it will be well to consider carefully the effects which would follow the imposition of the limitation upon the numbers and character of commercial aircraft which may be owned and operated by the nationals of a state. In the first place, if commercial aeronautics is allowed to follow the natural laws which have governed the development of all other means of transportation and communication, the number and character of such aircraft will probably depend on financial considerations. That is, commercial aeronautics as a business will not thrive unless the operation of the aircraft will return a substantial profit. The state may interfere with the operation of these natural laws by granting to the owners and operators of such aircraft a direct or indirect subsidy. By so doing enterprises which would not otherwise be financially successful may be enabled to live and in this way the number of aircraft used for commercial purposes will be greater than if the natural laws of development had been allowed to take their course.

"It is not easy to foresee what consequences to human progress will come in the future from the development of aeronautics in all its branches. They will certainly be marvelous where natural conditions are favorable to such development. To try to limit them now with arbitrary laws, even if these laws have the purpose of preventing war, would be in the opinion of this committee disastrous from the point of view of world progress.

"4. If, among commercial aircraft, we class those owned and operated for sport or pleasure or convenience, the numbers of these will depend largely upon the wealth of the nation, upon the inclination of the people toward aeronautics, upon the cost of the aircraft thus employed.

"5. The development of aircraft has presented the world with a new and improved means of transportation and communication. One of the causes of warfare in the past has been a lack of the proper distribution of the world’s resources in raw material, food products, and the like. Another potent cause of war has been the lack of understanding between races, peoples, and nations. Any addition to the transportation and communication facilities of the world should operate to improve the distribution of resources and likewise to lessen the causes of misunderstandings between peoples, and thus lessen the causes of warfare. Any limitation, therefore, placed upon commercial aeronautics would have the effect of limiting a means of transportation and communication.
between the different parts of the same state and between different states. It seems inconceivable that any limitation should be imposed upon commercial aeronautics unless it were with the avowed object of thereby limiting the air power of a state and thus decreasing the liability of war. Commercial aeronautics with its attendant development of an aeronautical industry and a personnel skilled in the manufacture, operation, and the maintenance of aircraft does furnish a basis of air power. The development of commercial aeronautics and the development of a nation's air power are inseparable.

"6. Speaking broadly, all aircraft will be of some military value no matter what restrictions may be placed upon their character. Some can probably be converted with but few changes into military aircrafts; others can be designed so that with major or minor alterations, or even with none at all, they can be employed for military purposes. As a matter of fact, the uses of aircraft in war are many. During the World War highly specialized types were designed for special uses. Military aircraft have likewise been developed to a degree of perfection not yet reached in commercial aircraft. It is quite reasonable to suppose that similar development will take place in commercial aircraft, that they, too, will be especially designed for the uses to be made of them, and that they may depart quite radically from the military types used in the World War.

"In military aircraft, as a rule, a premium is placed upon performance. Consideration of initial cost and cost of operation and of maintenance are largely disregarded. The safety and convenience of the operators and passengers are considered only as these affect their ability to perform their military duties. If, as seems evident, commercial aircraft must be specially designed for the service they are to perform in order to have a chance of being financially successful, any effort to provide for their conversion into military craft will introduce complications which will increase the cost of production and operation. This may itself automatically act as a limitation, for business enterprises will not be willing to have such conditions imposed unless they are compensated in some way for the extra cost.

"7. Heavier-than-air.—The war value of an airplane may be said to lie in a combination of two or more of the following characteristics:

"(a) Its suitability for offensive and defensive equipment.
"(b) Its radius of action.
"(c) Its speed.
"(d) Its carrying capacity.
"(e) The height it can attain.

"It is not desired to go too deeply into technical matters in this report. The committee wishes, however, to point out that the
peace value of aircraft is at present intimately bound up with the general characteristics which make up the value of the airplane in war. The last four of the characteristics enumerated above are dependent upon the relation between the amount of fuel carried, the horsepower of the engine, the lifting surface, and the total weight. The committee is of the opinion that formulae could be evolved defining the inter-relationship of these factors in such a way as to limit the war value of the machine built in conformity therewith. It is more difficult to insure that war equipment shall not be mounted in a commercial airplane. In this matter the committee is of the opinion that definite rules can not be laid down.

"Radius of action is of high commercial value. A reliable air service from Europe to America in, say 24 hours, should prove a highly profitable undertaking. Again, in countries where there is perhaps the greatest scope for the development of airways, countries of great deserts for example, radius of action is essential. Speed is plainly the characteristic on which aircraft rely to gain advantage in their competition with other means of transportation. It is not yet comfort and security but time-saving that will tempt passengers, mail, and valuable cargoes from old established services. To limit speed is to stop progress, to throttle aviation in its infancy.

"The power of carrying numbers of passengers or quantities of goods is of obvious commercial value and even the attainment of considerable heights may eventually be a definite requirement. As a matter of fact the success of recent experiments indicates that, with special means of supercharging motors, navigation of the air will in the future utilize high regions of the atmosphere to take advantage of less resistance of the air and of favorable high velocity winds.

"The factors which comprise 'military' performance have therefore, a high commercial value, and it is the opinion of this committee that any limitation of the character of civil and commercial aircraft must hinder the natural development of aviation; it is probable that restriction as to character will have, in fact, an even more adverse reaction on the progress of aviation than would be caused by a restriction on numbers.

"8. Method of limitation.—Aircraft can be limited as to number and character by an agreement arbitrarily fixing a maximum number for each nation that will not be exceeded and by imposing technical restrictions in such a way as to limit performance.

"9. The difference in organic law as between nations will probably prevent a single system of limitation being of universal application. Moreover, the rules of formulae, whereby alone the character of civil and commercial aircraft can be limited, must be detailed and stringent. At the same time, they will be easy
to evade, and infringement will not be obvious to the casual glance. Measurements of horsepower, supporting surface, fuel capacity, and weight will be necessary if security against evasion is to be insured by any other means than by trusting to the good faith of the contracting parties. No State could consent to having the nationals of another power continually inspecting all of its manufacturing plants in order to ascertain whether the limitations it imposed were being enforced.

"All these points received the closest of consideration with reference to the limitation of Germany's airpower and the matter is so complicated that the final drafting of the technical rules has not yet been completed. But taking rules as drafted and even assuming continuous inspection of a most stringent character, it appears that there are still loopholes for evasion. No rules can prevent aircraft being designed in peace to permit of the ready installment of larger tanks in war; engines can be made interchangeable, enabling one of higher power to be rapidly installed; even carrying surface can be increased by the standardization and interchangeability of wings and other methods, and it is not impossible to conceive of civil and commercial aircraft being designed with a view to ultimate war requirements.

"10. For the above reason, the committee is agreed that in the present stage of development of aviation a universal limitation by formula of the character of commercial aircraft is impracticable.

"11. Question of subsidy.—Without expressing an opinion as to the desirability of abolishing subsidies for the encouragement of commercial aviation, the committee points out that such subsidies, direct or indirect, can have a great influence on the character and number of commercial aircraft in relation to their war value. In fact, subsidies will tend to decrease the natural divergence between military and commercial aircraft and render the latter more readily adaptable to war uses. It is necessary, however, to add that indirect subsidies or other encouragement are most difficult to prevent, and even when acting in good faith Governments of different nations will place different interpretations on such encouragement.

"The question of whether subsidies are granted or not will have great bearing upon development of commercial aircraft in general, and will affect the future welfare of the nations. This question, therefore, can not be determined from the point of view solely of the adaptability for war uses.

"12. Civil aircraft.—In this discussion a distinction is drawn between commercial aircraft and civil aircraft; the latter will comprise all aircraft operated by a State except those which it operates in connection with its military enterprises. Civil aircraft will, therefore, include any which are State-operated in
the customs service, for transporting the mails, the exercise of its police powers, and the like. It is readily apparent that as aircraft operate in a medium where there are no physical barriers, they can compete in some measure with every means of transportation used on land or water. It is therefore possible for much of the transportation requirements of any State to be met by the operation of aircraft. Such aircraft manifestly are not dependent for their being upon their ability to be operated at a profit. The State will decide how best it may enforce its laws, exercise its police power, transport State-owned merchandise or mails, and the means used will be those which are most efficient and most economical from the standpoint of the State itself. The cheapest will not always be the best or the most satisfactory.

"The number and the legitimate use of aircraft by any Government for such civil purposes will, therefore, be limited only by the estimate placed upon the service which they can render and by the consent of the people to raising by taxation the amount of money which must be employed for their acquisition, operation, and maintenance.

"13. If the civil agencies of a State use aircraft for police or other purposes that are essentially military in character this class of civil aircraft should be discussed under the limitation of military aircraft.

"14. The number and character of such civil aircraft can be limited only by an arbitrary agreement among the States.

"15. It would, again, be utterly impracticable to set up any agency acting under authority other than that of a nation itself to regulate the number of civil aircraft owned and operated by the State.

LIGHTER-TAN-AIR CRAFT.

"16. Limitation of number and character.—The characteristics of lighter-than-air craft are such that limitation of number and character presents little technical or practical difficulty. It is a peculiarity of these craft that their efficiency is very intimately bound up in their size. Small dirigibles have a war value of their own, but it is limited and they can not be considered as offensive weapons. For example, a small vessel of this kind can not attain any considerable height while carrying a useful load, and even if filled with noninflammable gas its vulnerability to gunfire at the heights it could reach preclude its being utilized for such purposes as aerial bombardment. Only in large-sized dirigibles can a useful load be carried to a reasonable military height at a fair speed. Limitation of size is therefore sufficient to insure that lighter-than-air craft should be incapable of offensive aerial action. Moreover, the construction of
large dirigibles requires large shed accommodation and can not be kept secret; in this respect they resemble surface warships.

"17. It is therefore possible to regulate their numbers and size by a simple system of international agreement, and infringement of such agreement can be readily detected without a detailed system of control.

"18. The committee is agreed that the possibilities of war use for large dirigibles may still exist. Although in the later stages of the World War it appeared as if the defense had the mastery over attack in lighter-than-air craft, the introduction of larger craft filled with noninflammable gas and carrying their own protective aeroplanes may again permit bombardments being carried out by dirigibles.

"This committee desires, however, to draw attention to the fact that dirigibles become increasingly efficient with increase of size. Any limit which is imposed on the size of commercial dirigibles must shut the door on the possibility of their development for legitimate civil enterprises.

"19. Limitation of the use of aircraft.—The committee is of the opinion that it would be useless to attempt to lay down a rule that civil and commercial aircraft should not be used in war, as they consider that no nation could deny itself the value for war purposes of their commercial machines provided that they are suitable for any warlike purposes. It is understood that when so used they will be manned by service personnel of the State and carry the proper distinguishing marks, and will in fact become war aircraft; their use does not therefore require discussion in this part of the committee report.

"20. The use of civil and commercial aircraft in peace is governed by the International Air Convention, which amply safeguards a State' s sovereignty in the air against abuse.

"21. This convention has already been ratified by Great Britain, France, Japan, Belgium, Greece, Portugal, Serb-Croat and Slovene State, and Siam. It will at a very near date come into force for these various powers and later for the other signatory States and also nonsignatory powers who desire to adhere to it.

"22. The committee is aware, however, that for certain reasons the United States has not yet announced its adherence to this convention. The committee therefore suggests for the consideration of the subcommittee on program and procedure that a convention covering the different phases of aerial navigation and based upon the one mentioned above could be drawn up at this conference to which the assent of all powers represented could be given. The committee further believe that this is most desirable.
"23. Civil and commercial aircraft.—This committee understands that the purpose of this conference is to promote peace and to remove the causes of warfare. It must be understood distinctly that if the conference decided to limit the development of commercial aircraft in order to retard the development of air power the immediate result will be the retarded development of means of transportation and communication, which will itself, if unrestricted, largely act to bring about the same result, the removal of some of the causes of warfare.

"24. This committee is unanimously of the opinion that in the present state of development of aeronautics there is a technical possibility of the limitation of numbers, character, and use of civil and commercial aircraft with regard to their utilization in war; they are, however, agreed that such limitation of numbers, and especially of character, is not practicable, except in the case of lighter-than-air craft of above a certain displacement.

"25. As regards the desirability of limitations, the committee has touched on those factors which must be understood before arriving at a decision. It feels it to be a duty to lay great stress upon the following fact, which will have a decided bearing upon any determination of the proper policy to be adopted: Any limitation as to number and character of civil and commercial aircraft, heavier than air or lighter than air, which is efficacious to hinder their utility for war purposes must interfere disastrously with the natural development of aeronautics for legitimate civil and commercial enterprises. To limit the science of aeronautics in its present state is to shut the door on progress. It is for the conference to decide whether the limitations which can with difficulty be devised and imposed are to be adopted at such a cost.

"Military aircraft.—(Note. In the part of the report which follows the word 'military' is used in its widest sense to denote 'pertaining to the fighting services, whether naval, military, or air.')

"26. Preliminary remarks.—The committee agreed that before entering upon a discussion of possible limitation of the numbers of military aircraft it was desirable that the present relative strength of the nations represented should be ascertained and tabulated in a simple form designated to facilitate comparison between them. The results of this investigation are tabulated in appendixes 1, 2, 3, 4, 5, attached to this report. It is remarked that though these forms afford a guide to the relative military air strengths at the present day, it is impracticable to present a complete estimate of a nation's air power, since air power is (as has been already shown) intimately bound up in factors other than the military establishment. Differences in organization and
administration of the various national aerial forces are a further obstacle to direct comparison in detail; these factors must not be forgotten when studying the statement presented and must be kept in the foreground of all discussions as to the possibility of limitation.

"27. As to number."—The limitation of the number of military aircraft presents from one point of view less difficulty than the similar problem in the case of commercial aircraft. It is obvious that if a limitation on the number of military aircraft is agreed upon between nations, it can be imposed by a state without that interference with the liberty of citizens which complicates the question of aircraft devoted to commercial pursuits. But when the details of such an agreement are considered, it will be found a matter of great difficulty to find a reasonable basis on which the allotment of relative strengths can be made. For example:

"(i) The 'status quo' cannot serve as a starting point, since the state of development of air services differs widely in the case of the various powers (see appendixes), and in no case can these services be considered as complete.

"(ii) The size of a nation's navy and army will influence the basis, in so far as aircraft are essential auxiliaries to those services.

"(iii) National policy will differ as between nations: some nations, for example, will wish to have large air forces for coast defence where others prefer to trust to older methods. Development on the lines of the substitution of air forces for other forms of force are likely to be considerable.

"(iv) The potentialities of air forces in policing and garrisoning semicivilized countries or uncivilized countries, are as yet only partially realized. The number of aircraft required for such duties will vary with the size and nature of the territories to be patrolled and with the value placed on their services by different nations.

"(v) The geographical position and peculiarities of a state, the situation and strength of its possible enemies, and the nature of a possible attack must influence the number of aircraft it will desire to maintain.

"(vi) Different terms of service for personnel will influence the effectiveness of air services and the size of the reserve.

"(vii) The state of development or possibilities for civil aeronautics will have, as has been shown above, a direct bearing on the number of military aircraft which it may be desirable for a state to maintain.

"The problem of finding a suitable ratio between the air forces of various powers is thus at the present time almost insuperable.

"28. As to character."—But even should it be possible to fix the ratio, such a limitation would be of little value without some limit
as to the character of the aircraft. When the question of limitation of naval armaments was considered by the conference it was found necessary to limit the displacement of individual ships as well as the total tonnage. In the absence of similar provision the limitation of numbers of aircraft would only result in competitive building of aircraft of greater and greater power and size. The methods of limitation must therefore attempt to legislate for both number and character.

"HEAVIER-THAN-AIR.

"29. Methods of limitation.—The following methods may be employed:

"First. The limitation of the number of military aircraft.

"Second. The limitation of the amount of horsepower for military aircraft.

"Third. The limitation of the lift tonnage for military aircraft.

"Fourth. The limitation of personnel for military aircraft.

"Fifth. The limitation of military aircraft budgets.

"These five methods may be applied in combination or singly and are considered in detail below:

"30. Limitation of the number of aircraft is the most obvious method of limiting the strength of the aviation force, but in attempting to apply this method the question of size and type at once arises. It might be necessary to limit the maximum wing surface permitted to a single aircraft or it might be necessary to prescribe the number of aircraft in each of the type groups, such as combat planes, bombing planes, etc.; this question of definition of type presents great difficulty. In order to make an effective limitation of the numbers of military aircraft to be maintained in peace time by any nation, it will be necessary to have a detailed understanding on the following points:

"(1) On the number and types actually in use by organized aerial units.

"(2) On the number and types held in reserve.

"(3) On the number and type of engines held in reserve.

"(4) On the replacement of planes crashed, worn out, or replaced by later models. In the case of obsolete and other planes that are replaced by other models it would be necessary to enter into an agreement regarding the disposal of planes so replaced. Otherwise it would be possible to build up an unlimited war reserve merely by classifying the planes so held as obsolete, or by converting them into civil or commercial planes.

"(5) On the limitation of the adoption of new and more powerful types.

"All these points will present great difficulty in an age when aircraft can become obsolete in a few months, and when their
nature is such that war wastage may be as high as 200 per cent per month.

"31. The second method of limitation, limitation of horsepower, may apply to:

"(1) Total horsepower in assembled planes.
"(2) Total horsepower in assembled engines.
"(3) Horsepower in a single individual plane of a given type.

"This can only be based on the cubic capacity of the engines; there will be no guaranty that a nation has not discovered a secret which will enable greater horsepower to be got out of limited capacity, nor is it reasonable to expect any nation to disclose such a secret. The more detailed the limitation the greater the administrative difficulty of enforcement, particularly under present conditions, when administrative methods are so widely different, and, as pointed out in the first part of the report, any enforcement, to be effectual, would entail such detailed inspection by a foreign commission as to be intolerable to any nation.

"32. The third method of limitation, limitation of lift tonnage, may apply to:

"(1) Total lift tonnage in assembled planes.
"(2) Total lift tonnage in all planes assembled or not assembled.
"(3) Lift tonnage of a single individual plane of a given type.

"Any method must presumably be based on wing area and horsepower. It has been mentioned that the actual horsepower may be unknown, and it is likewise conceivable that a nation may discover a wing shape of extreme lifting efficiency and neglect to disclose the fact. Limitation of lift tonnage may therefore be wholly illusory, and the remarks as to inspection made in the last paragraph apply to this method also.

"33. The fourth method of limitation, whether of the total or organized personnel for war aircraft or only of pilots in the permanent military establishment, fails by reason of the difference in organization between different states. A nation which has a separate air service has to include in its organized personnel those employed in recruiting, supply, transport, administrative headquarters, etc. In the case of nations whose air forces are contained in their naval and military forces, supply, etc., personnel are included in naval and military establishments; a fair comparison can not therefore be made. Moreover, the difference in terms of service, long or short, voluntary service or conscription, must introduce incalculable factors which directly affect the efficiency of organized air forces and the size and efficiency of the reserve.

"34. The fifth method of limitation, limitation by means of limiting the budget and thereby controlling the amount of money that may be expended annually for aviation, seems simple in theory, but it is difficult of application. The various methods of
Difficulties.

Distributing budgets for material under different subheads make it impracticable to determine or compare the actual sums expended exclusively for aircraft, and the question is at present further complicated by the factor of the relative purchasing power of the currency of various nations.

"35. Of the five methods of limitation, limitation by lift tonnage or horsepower appears to present the least objections; but to make these or any other methods effective, it would be necessary, as previously pointed out, to organize a system of international inspections. Any system of international inspection would be almost certain to arouse ill-feeling and would tend to cause friction rather than to insure harmony and good feeling between friendly powers.

"36. Impracticability of limitation of number and character.—Objections in detail to each suggested method of limitation have been advanced above—there is one insuperable objection which is common to every method, namely, the close relationship which at present exists between civil or commercial aeronautics and air power. Unless civil and commercial aeronautics are strictly limited—and it has been shown in the early part of this report that it is not practicable to limit them—a nation desiring air power in excess of the limit imposed or agreed to will develop its civil and commercial aeronautics to any extent desired.

"Granting a flourishing aeronautical industry, the number of the present type of perishable military airplanes active on any given date is only one of the elements of air power. During the war a single American firm contracted to deliver 100 aircraft a day, and the output of engines can be organized on a similar scale. A nation's air power can thus be multiplied not only by the actual number of civil and commercial aircraft in use but also by the capacity of the industry to turn to the manufacture of military aircraft in large quantities. Limitation of the number of horsepower and lift tonnage would under such conditions prove illusory. This commercial industry will further provide a great potential reserve of pilots and skilled technical personnel and will thus discount to a great extent any limitation of numbers of the personnel of military aviation.

"37. It is the opinion of this committee that the limitation of military air power (as regards heavier-than-air craft) is not practicable at the present time. Their reasons for this decision are as follows:

"(I) The difficulty of finding a basis for the proportion of aircraft to be allotted to the various nations.

"(II) The difficulty of devising technical methods to impose such limitation.

"(III) The difficulty of enforcing such methods.
"(IV) The interdependence between air power and a commercial aircraft industry which it is not practicable to limit.

"38. Lighter-than-air craft.—Many of the remarks already made apply to lighter-than-air craft but, as in the case of commercial aircraft of this nature, limitation is both possible and practicable. It is unnecessary to recapitulate the argument that the military value of a dirigible is dependent on its size, and the size of dirigibles and the number maintained can be limited by agreement of a few simple rules. Infraction of such rules can be rapidly ascertained without detailed inspection. But such a limitation of lighter-than-air aviation forces would not effect a limitation of this kind of air power of a nation unless a limitation were also imposed on its lighter-than-air commercial activities. The line of demarcation between the large commercial airship and the military airship is very slight, and a commercial dirigible would require little, if any, alteration in order to adapt it to military purposes. The objections to the limitation of the number or character of commercial lighter-than-air craft have already been remarked on.

"The question of the use of military aircraft.

"39. It is necessary in the interests of humanity and to lessen the chances of international friction that the rules which should govern the use of aircraft in war should be codified and be made the subject of international agreement.

"40. The matter has been considered by this committee in connection with a draft code of "Rules for Aircraft in War" submitted for remarks by the committee on the laws of war. The subject appears to the committee to be one of extreme importance and one which raises far-reaching problems, legal, political, commercial, and military; it requires, therefore, exhaustive discussion by a single committee in which experts on all these issues are assembled.

"The representatives of the United States and Japan on this committee are prepared to discuss the rules submitted from a technical point of view as provided for in the agenda under paragraph on limitation of new types of military arms, but the representatives of Great Britain, France, and Italy are not so prepared. They state that the time between receipt of the agenda for the conference and their date of sailing has not permitted that exhaustive discussion of the subject that would enable them to advance a national viewpoint on a matter which affects so many and varied interests. In some cases the national policy has not yet been determined.

"41. This committee recommends therefore that the question of the rules for aircraft in war be not considered at a conference in which all the members are not prepared to discuss so large
a subject, but that the matter be postponed to a further conference which it is recommended be assembled for the purpose at a date and place to be agreed upon through diplomatic channels.

"SUMMARY OF CONCLUSIONS ARRIVED AT BY THE COMMITTEE ON NUMBER, CHARACTER, AND USE OF AIRCRAFT.

"42. The committee are agreed that among the more important elements which influence the power that a nation may exert by means of aircraft are the following:

"(1) The adaptability of its people to aeronautics.

"(2) Geographic location and characteristics of the territory occupied by the nation and its dependencies.

"(3) The ability to produce and maintain aircraft and accessories.

"(4) The amount and character of aeronautical activity outside the military establishment, such as commercial and civil aeronautical activities, and sport and pleasure flying.

"(5) The size and efficiency of its air establishment for military purposes, consisting of (a) the active establishment, including permanent headquarters, bureaus, squadrons, schools, technical establishments, depots of material and personnel, etc.; (b) the reserve establishment, including organized and unorganized reserve personnel and war reserve of material.

"43. (1) The adaptability of a nation to aeronautics.

"Interest of the general public in aeronautics seems to be inherent in some nations; in others it is dormant or almost lacking. The confidence of a people in aeronautics in general is undoubtedly a factor worthy of serious consideration when estimating the air power of that country. It is possible that a far-seeing Government may stimulate the interest of its general public in aeronautics by exhibitions, general educational measures, and by the encouragement in a financial way of individuals already interested, and thus increase the adaptability of its people to aeronautics.

"44. (2) Geographic location and characteristics of the territory occupied by the national and its dependencies.

"This may be looked on as closely akin to (1). The physical characteristics of a country will have a considerable influence on the attitude taken by its inhabitants toward aviation. It is obvious that, while government action may improve the natural characteristics of a country to a certain degree, by making aerodomes, etc., it is not possible for any limitation of such action to be made except by limiting the total amount spent by the nation on aviation, a method which has already been shown to be largely ineffective.

"45. (3) The ability to produce and maintain aircraft and accessories.
"The maximum aeronautical industry possible for a nation to build up under ideal conditions is determined by (1) the extent to which manufacturing in general is carried on; (2) by the character of articles manufactured; (3) by the manufacturing methods in general—that is, whether articles are manufactured by machinery or by hand; (4) the supply and availability of essential raw materials. In the manufacture of many articles the raw materials used and the manufacturing methods are similar to those employed in the manufacture of aircraft and accessories. The amount of this class of manufacturing carried on in any country is an essential factor in estimating the ability of a nation to produce aircraft.

The ability to expand an existing aeronautical industry rapidly enough to meet war conditions is one of the most important elements of air power. This may be estimated by (1) the number of individuals skilled in the manufacture of aircraft and accessories; (2) the number of individuals whose training in industries similar to the aeronautical industry forms a basis for learning readily and rapidly the special problems encountered in the manufacture of aircraft and accessories; (3) the size and condition of the existing aeronautical industries and the size and number of manufacturing concerns that can readily be converted to the manufacture of aircraft and accessories; (4) the existence of a definite program previously determined upon and the extent to which orders have been previously placed in anticipation of an emergency with a consequent perfection of plans; (5) the amount and state of availability of the essential raw materials; (6) the quantity of available jigs, tools, dies, and production drawings for going into quantity production of standard equipment.

46. (4) The amount and character of aeronautical activity outside the military establishment has been exhaustively discussed under the limitation of civil and commercial aircraft. It has been shown that this is intimately bound up with (1) (2) and (3), as above, and that, with the exception of lighter-than-air craft of above a certain size, it is not practicable to limit it except perhaps by limiting the amount of subsidies to commercial aviation, a method which has been shown to be difficult of application and to be otherwise objectionable. It has also been shown that the limitation of lighter-than-air craft would have a disastrous effect on aviation.

47. (5) Existing establishment of aircraft used for military purposes and the reserve.

The size of the organized reserve will depend upon the size of the military establishment and the rate at which the members of the military establishment are trained and returned to

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civil pursuits. Any reduction in the permanent peace-time establishment will carry with it a consequent reduction in organized and trained reserves. There is, however, a type of personnel whose civil pursuits fit them for immediate service in the air establishment. This class is made up by those engaged in commercial and civil aeronautics and industrial pursuits which require the same trades and basic knowledge and experience as is required in the operation and maintenance of military aircraft. This class will not be seriously affected by any change in the military establishment.

48. Technical considerations have led the committee to the conclusion that the limitation of the fifth element, namely, the size and efficiency of peace-time air establishments for military purposes (including the active establishment and the organized reserve), although theoretically possible, is not practicable. The committee also desires to lay stress on the fact that, even if such limitation was practicable, it would not prevent the use of air power in war, but would only operate to give greater comparative importance to the other elements of air power which can not be limited for the reasons given in the report.

*Final Conclusion.*

"Number and character.—The committee is of the opinion that it is not practicable to impose any effective limitations upon the numbers or characteristics of aircraft, either commercial or military, excepting in the single case of lighter-than-air craft.

"Use.—The committee is of the opinion that the use of aircraft in war should be governed by the rules of warfare as adapted to aircraft by a further conference which should be held at a later date.

"Respectfully submitted by committee on aircraft.

"For the United States of America:

"WILLIAM A. MOFFETT, Chairman,

"Rear Admiral, United States Navy.

"MASON M. PATRICK,

"Major General, United States Army.

"For the British Empire:

"J. F. A. HIGGINS,

"Air Vice Marshal, R. A. F.

"For France:

"ALBERT ROPER, Capitaine,

"Pilote Aviateur, French Army.

"For Italy:

"RICCARDO MOIZO,

"Colonel, R. I. A.

"For Japan:

"OSAMI NAGANO,

"Captain, I. J. N."
"Note.—The Italian representative believes and desires to place on record that one way in which it would be possible to limit the air power of a nation would be by placing a limit upon the number of pilots in the permanent military establishment and consequently agrees with the general reasoning of the report in so far as is not contrary to this opinion.

"(Signed) Col. R. Moizio, "Riccardo Moizio, "Colonel, R. I. A."

The chairman said that the report was now before the committee for such action as might be deemed advisable.

Mr. Sarratt said that the report would have to be translated, and the reading of it alone would take some time; the subject was not on the agenda. He believed that he voiced the opinion of his colleagues on the committee as well as his own in saying that under the conditions it would be advisable to afford time for the necessary examination of the contents of the report.

The chairman said that, in view of the very short time there had been for the examination of the voluminous report, he thought that abundant time should be given for its consideration; he had taken it up that morning merely because other subjects had been disposed of, and he thought that even a general statement might aid the committee in making progress with its work. He was not aware that the committee was prepared to take up another matter at that time, and he therefore suggested that, if that was agreeable to the committee, adjournment be taken until Monday.

Lord Lee asked whether the chairman would give some indication of what subject would be discussed after the report on aircraft; from present indications the consideration of this report would take only a short time, and the British delegation would like to be prepared for what was to follow.

The chairman said that three subcommittees had been appointed, one on gas, one on aircraft, and one on rules for the conduct of war. The committee had dealt with the report on gas and adopted a resolution; it had had before it the report on aircraft. He understood that the subcommittee on rules of war believed that it would be impracticable, at this conference, to do more than suggest that these should be carefully examined and made the subject of consideration at another conference. If that was the sense of the conference, and no extended examination of the question was to be made, he supposed that the next order of business would be the consideration of the report of the details of the proposed naval treaty, with respect to all the matters which were then engaging the attention of the naval experts and the legal experts. He was unable to say whether that would be ready for the next session or not. He assumed that it was the next topic
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to be taken up, if it was decided not to discuss rules for the con-
duct of war.

Mr. Balfour said that he had listened with great satisfaction to
Mr. Hughes's observations on the report. As concerned a general
revision of the rules of warfare, he said he was afraid he must dis-
courage any attempt to deal with that tremendous subject. He
was in some doubt as to whether it came within the list of sub-
jects which his Government had authorized him to discuss; but
however this might be, he thought that all his colleagues would
be wise to limit their ambitions in this direction as closely as
he did.

Sir Robert Borden said he had been much impressed with the
suggestion of Lord Lee on a previous occasion that, should another
great war break out, questions raised by the illegal use of subma-
rines might arise concerning the use of aircraft in connection with
the search, seizure, and capture of merchant vessels. Sir Robert
Borden merely wished to remind his colleagues of this point with-
out even suggesting that it should be considered by this conference.
But the subject was, in one sense, connected with the conditions
under which merchant ships might be ordered to stop and might
be searched, seized, and eventually captured. This might be done
by aircraft in the next war; in the last war it had been governed
by the rules as they were then understood, which had not been
conformed to by one nation. If no principles were formulated,
the powers might be confronted with the same problems with
respect to aircraft.

Lord Lee said that he was well aware of the importance of the
point raised by Sir Robert Borden and that, in fact, it was the
point he himself had brought to the notice of the conference. He
supposed, however, that it would be in order for it to come under
the second of the final conclusions of the report on the limitation
of aircraft. If this conclusion should be accepted by the com-
mittee, as Lord Lee assumed it probably would be, then the matter
would go over to the further conference suggested therein—a
course which he would not oppose.

Senator Schanzer said he desired to add a few words in the
same connection as those of Sir Robert Borden. The conclusion
reached by the subcommittee of experts was that the conference
should not attempt to fix rules for aircraft, and that this question
should be referred to a future conference. He had at the present
time no formal proposition to present, but he thought the matter
ought to be discussed. He was entirely in accord with Mr. Bal-
four, that the conference should not attempt to pass on the vast
subject of the laws of war, as time did not permit of this; but it
was impossible not to consider the fact that certain laws previ-
ously made—such as those contained in Mr. Root's resolutions re-
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Regarding submarines—had been reaffirmed at this conference; in the same resolutions the powers represented on the committee had stigmatized the abuses of the submarine and had established sanctions. It was impossible to forget the excesses committed by military means by the bombardment of open towns in Italy during the recent war. This had been forbidden by The Hague convention and, just as the committee had thought it necessary to condemn excesses committed in connection with submarine warfare, would it not be helpful to condemn the excesses committed in connection with the bombing of open towns? He did not know whether it was proper to suggest such a proposition at that time, but he thought that there should be a discussion of the matter for the purpose of ascertaining whether a resolution forbidding the bombardment from the air of open towns and villages could not be formulated.

The chairman said that if it were proposed to discuss the question of rules of war, except possibly in a very limited sphere, the committee would enter upon a field which, he assumed, would give it a great deal of concern and would require prolonged study and discussion. He did not suggest that the committee should not enter upon that field if the delegates desired that these subjects should be taken up. He supposed that the report on aircraft could be dealt with, in its main features, in a comparatively short time. The report was voluminous, but that very fact led to an easy comprehension of the recommendations. If it was desired, in connection with the use of aircraft—for example, in relation to merchant ships and undefended towns—to bring forward specific resolutions, there would be opportunity to do so. He suggested, however, that the committee adjourn until Monday at 11 o'clock, and that it then proceed with the discussion of the aircraft report. If anything else was ready, when that had been disposed of, the committee would take it up.

The committee then adjourned until Monday, January 9, 1922, at 11 o'clock a.m.

EIGHTEENTH MEETING—MONDAY, JANUARY 9, 1922, 11 A. M.

PRESENT.

United States.—Mr. Hughes, Senator Lodge, Mr. Root, Senator Underwood, Col. Roosevelt, Admiral Coontz. Accompanied by Mr. Wright, Mr. Clark.

British Empire.—Mr. Balfour, Lord Lee, Sir Auckland Geddes, Rear Admiral Sir E. Chatfield, Sir Robert Borden (for Canada), Senator Pearce (for Australia), Mr. Sastri (for India). Accompanied by Sir Maurice Hankey, Air Marshal Higgins, Capt. Domvile, Mr. Malkin, Mr. Flint, Mr. Christie.