SCIENCE

NEW YORK, MARCH 11, 1892.

THE SCIENTIFIC ALLIANCE.

THE Scientific Alliance of New York was organized in March, 1891. It consists at present in a union of six societies engaged in the promotion of scientific research. It is probable that this number will soon be increased to eight, and it is hoped that it may ultimately extend to at least ten. Membership in the Alliance is not confined to societies in New York City, but may include those in the neighborhood.

The societies now composing the Alliance,—naming them in the order of their foundation,—are as follows: 1. The New York Academy of Sciences, 2. The Torrey Botanical Club, 3. The New York Microscopical Society, 4. The Linnean Society of New York, 5. The New York Mineralogical Club, 6. The New York Mathematical Society.

The societies do not in any way sink their individuality or surrender any part of the management of their own affairs. Their union is merely in the way of co operation for the advancement of science and for mutual encouragement, carried out through a central representative body, known as the Council, having advisory powers only. The Council is made up of the president, *ex-officio*, and two other delegates from each society.

A monthly bulletin is issued under the authority of the Council, announcing the proposed proceedings of all the societies, and a copy of this bulletin is sent to every member. The bulletin contains an invitation to the members to attend the meetings of all the societies.

The Council issues an annual directory, containing the names and addresses of all the resident members of the societies, as well as general information as to the character and purposes of the several organizations. It is proposed to issue also a brief annual report of the work done by the societies as a whole. The first directory published by the Council (that for 1891) contained 499 names. That for 1892 will contain a considerably larger number, as the membership of the societies has increased materially during the past year.

The New York Academy of Sciences was chartered as The Lyceum of Natural History, April 20, 1818. It was reorganized under its present name Feb. 21, 1876. It has a total membership of about 550, of which nearly one-half are resident members and fellows. It holds weekly meetings, on Monday evenings, from October to June. One evening of each month is devoted to a popular lecture. There are special sections of mineralogy and astronomy. Its place of meeting is now at Columbia College. The Academy publishes both Annals and Transactions. The Lyceum of Natural History was the owner of a building and a valuable scientific collection, which were destroyed by fire. The Academy possesses a library of between 10,000 and 12,000 volumes, which is being continually augmented by periodicals and Proceedings of kindred societies received in exchange for its own publications. This is an exceedingly important collection of scientific works, containing sets of the Proceedings of foreign bodies not to be found in any other library in New York, and in some cases not elsewhere in this country. At present the books are deposited in the library-building of Columbia College, but they may be withdrawn at any time.

The Torrey Botanical Club was incorporated April 21, 1871. It has a total membership of nearly 300, of which about one-half are resident members. It holds meetings twice a month, at Columbia College, and field-meetings every Saturday from April to November. It publishes a Bulletin and Memoirs. It has an herbarium of nearly 20,000 specimens. Its botanical library is incorporated with that of Columbia College. It consists of periodicals and Proceedings of other scientific societies, obtained by the exchange of publications, which are, for the most part, duplicated in the library of the Academy of Sciences.

The New York Microscopical Society was incorporated in 1877. It has a total membership of about 100, of whom some 75 are active members. Its meetings are held twice a month, at the Mott Memorial Library, No. 64 Madison Avenue. It publishes a quarterly journal. Its library consists of about 2,000 volumes, and is deposited at its place of meeting. It has also a collection of about 5,000 microscopical specimens.

The Linnean Society of New York was organized March 7, 1878. It has a membership of 85, of which about half are resident members. Its meetings are held twice a month, at the American Museum of Natural History. It publishes Transactions and an Abstract of Proceedings. It has a library consisting of exchanges from publications.

The New York Mineralogical Club was organized in 1887. It has a memberihip of about 60. It holds monthly meetings at various places. It owns the Chamberlain collection of New York Island minerals, which is deposited temporarily, with other strictly local minerals, in the American Museum of Natural History.

The New York Mathematical Society was organized Nov. 24, 1888. It has a membership of over 200, including almost every mathematician of note in America, and some residing abroad. Its local membership is about 35. It publishes a monthly Bulletin.

It will be seen from the foregoing summary that all of the societies included in the Alliance occupy only temporary quarters, and that their libraries and collections are widely scattered. It will be observed, however, that the latter are of sufficient size and importance to make a very creditable appearance if they could all be gathered in a single suitable place. It is confidently believed that the total amount of original scientific work brought out by the meetings of these societies is as great as that accomplished in any other city in America. Under proper conditions, however, the societies might not only become more helpful to one another, but might confer a greater benefit upon the community at large, by carrying on lines of work which they are now compelled to neglect from want of room and facilities. For example, all attempts at exciting popular interest in scientific subjects is now confined to a course of seven or eight lectures during the year, carried on by but one of the societies, when, in fact, if the Alliance were placed in possession of the necessary building and appliances, there is no reason why it

might not exert the same educational influence in New York as is put forth by the Royal Institution of Great Britain in London, in which a course of as many as eighty lectures of more or less popular interest has been given in a single season.

The brief experience which the Scientific Alliance has already had has convinced the members that a still closer union of the societies is necessary to the most effective accomplishment of their purpose, and this feeling has taken the form of an earnest movement for obtaining a permanent building as a home for all the societies. A building committee was appointed in October last, and has held several meetings and done much towards developing plans for the accomplishment of the object mentioned.

In the main these plans embrace the idea of the erection of a building, in the central part of the city, large enough to afford each society rooms for its ordinary meetings, for its library and collections, as well as facilities for research, and also to contain a lecture-hall, capable of seating twelve hundred people, to be used by all the societies in their public work. It is part of the aim of the Council to obtain, ultimately, if not at once, in connection with the proposed building, a fund for its maintenance and for the endowment of original research and publication.

It is hoped and believed that at this time, when public spirit appears to be undergoing a revival in New York, and numerous worthy objects are receiving generous aid and establishment by men of wealth, the cause of science will not be overlooked or neglected. Music and other fine arts and various charities have recently received munificent assistance in the very direction in which the Alliance is looking for aid,— namely, the erection of buildings suited to their particular needs,— and it seems reasonable to think that the man, or men, will soon be found with sufficient appreciation of scientific research, for both its educational and its practical value, to place it in a position as solid and substantial as that now likely to be occupied by the fine arts and by organized benevolence.

ACTINISM.

ON studying the nature of the action of the blue, or rather the violet, ray of the spectrum, it appears to me to be a misnomer to refer to it as chemical. The absorption of heat attends chemical decomposition, and on the other hand the disengagement of heat is the accompaniment of chemical combination. We read in Professor Wurtz's excellent treatise on "The Atomic Theory:" "It is heat which sets the atoms in motion; they have absorbed heat in separating from each other, since the rupture of the molecular equilibrium which marks the end of the state of combination has required the consumption of a certain quantity of heat. The heat thus absorbed has restored to the atoms the energy which they possessed before combination, and which represents affinity. This heat is lost again whenever the atoms, passing into the sphere of action of other atoms, fix the latter in some manner or are fixed by them so as to form new systems of equilibrium — that is, new molecules — in which henceforth their vibration and motion are preserved. This action is reciprocal." If with this we compare what takes place in the so-called chemical action of the violet ray, we find a great difference. The latter process is usually referred to as one of decomposition and not of combination, and, in fact, photography is based on the property possessed by light of decomposing chemical compounds by its reducing action.

It is true that this decomposition is supposed to be attended with certain chemical changes, as is the case also with the decomposition of amyl and other vapors in Dr. Tyndall's very interesting experiments in cloud making, although there appears to be some doubt as to the nature of the changes. Moreover, in the action of the violet ray on a mixture of chlorine and hydrogen gases the formation of hydrochloric acid would seem to be due to the operation of chemical affinity. Nevertheless, when we consider the analogy between this case and that of the formation of water by the passage of a current of electricity through a mixture of oxygen and hydrogen gases, a question may be raised as to whether the former is due to strictly chemical action. The phenomenon of electrolysis, in which the electric current decomposes a molecular compound, is, moreover, analogous to that of the decomposition of chemical compounds by the actinic action of the violet ray. The latter phenomenon answers to the decomposing action of heat, and the former to the combination of elements which attends chemical action; but they are not the same. This is evident from the fact that, while in the one case the combination precedes the discharge of heat on which decomposition depends, in the other case it follows decomposition.

Nevertheless, in all cases actinic action would seem to be attended with the aggregation of at least one element of the decomposed chemical compound. Thus, when on the exposure of chloride of silver to the action of light the chlorine is expelled, the silver is precipitated. The result depends on the instability of the equilibrium of chemical combination in the presence of certain light-rays, and it is thought that all substances are thus more or less affected by light. It is found that the red rays are chemically inactive, and of the others the absorbed rays are those which bring about the decomposition which is the basis of actinic action. The liquid nitrite of amyl allows the transmission of the yellow rays, and Dr. Tyndall states that the blue rays, as complementary to the yellow, are absorbed, and therefore that they produce the "chemical" effect. As a fact, however, the complementary of yellow is violet, and the greatest actinic action is in the violet ray, and it extends far beyond into the invisible rays. This in itself would seem to prove that actinism is not chemical action, as the intimate relation between this force and heat would lead us to expect the association of chemical action with rays towards the red end of the spectrum. The vibrations of heat are atomic and not molecular, and possibly this fact may have influenced Dr. Tyndall in his opinion that the absorption of the actinic rays occurs in the main within the molecule, and are not the act of the molecule as a whole. There is no reason, however, why the absorption should not be of the whole molecular mass; that is, of the body of molecules that make up the mass, just as the absorption of heat is that of the atoms which make up the molecule.

Here would seem to be the real explanation of the phenomena of actinism, which is a distinct power of light due to its activity as a molar energy, just as heat is an atomic energy. The combination which follows the decomposition effected by actinic action has a similar relation to chemical combination. The latter is atomic, whereas the former is molar, as it affects the mass, and this through its molecules and not through the atoms of which these are composed. From the fact that the electric light contains a large proportion of actinic rays, and that the electric spark in rarified air is diffused and of a violet color, it might be supposed that actinism is only a phase of electricity. That they are closely