

qualities. Mating which is selective *qua* cancer is at present not practised by man, and in human experience heredity is negligible. But with the same inducement in the way of irritation, some people are no doubt more liable to develop tumours than others.

No one succeeded clearly in reproducing this experience about irritation experimentally until, in 1914, Yamagiwa and Ichikawa showed that cancers of the skin could be produced fairly regularly by the patient and persistent application of tar to mice. In other animals it is more difficult, and we owe one great advance in our knowledge of cancer to this peculiar susceptibility of mice just as we owe another to the exaggeration of the active agent by the Rous tumours. General principles are often revealed by special instances.

This great discovery is important in many ways. It put into the hands of experimenters a method of producing new cancers at will. Using it to test the carcinogenic properties of various irritants, they have found that coal products have an efficacy which seems to be unique: tar and soot and mineral oils and various preparations made from them all contain something (which has not yet been precisely identified) which causes cancer more or less readily in mice. We have here the experimental verification of the association recognised long ago in chimney-sweep's cancer of the scrotum, and in such statistico-geographical inquiries as those of Mr. C. E. Green, who clearly worked out the connexion between cancer and burnt coal with a layman's enthusiasm and common sense. The case against soot has come to be a very strong one.

If cancer can be produced by irritation, it is reasonable to assume that the active agent has originated in the irritated tissues. It is known from a variety of evidence that the products of the autodigestion which dead cells undergo in the body stimulate the growth of cells, and that the tissues of embryos are particularly rich in these growth-promoting substances. The implantation of embryonic cells into the body of an animal of the same species does not give rise to a tumour. But, as Carrel showed, a positive result may occasionally be obtained if to the mashed-up embryo a little arsenic or indol is added, which also by itself would be ineffective. The next step in this sequence also

came from Dr. Murphy at the Conference. He announced that by treating the testicles of normal fowls by the same technique that resulted in the separation of the active agent from fowl tumours, he had obtained a preparation which caused malignant tumours when inoculated into fowls. Dr. Leitch also stated that he had found that extracts of pancreas were singularly effective in aiding the action of tumour extracts, and that on one occasion he had succeeded in producing a tumour with an extract of normal pancreas by itself.

These remarkable results of course require confirmation, but they are not unexpected, and follow naturally from our previous knowledge. They suggest that tar, for example, unmasks an active agent which is normally present in an ineffective form or is held in check by the resistance of the tissues. It may be that the active agent arises (or is let loose in an effective form) in the body as the result of cell injury and degeneration much more often than we commonly suppose, and that it fails to give rise to an obvious cancer either because ancillary substances are absent or because inhibitory substances or processes are present. The practical problem of cancer prevention may perhaps be more fruitfully phrased as, Why does not everybody have cancer? rather than as, Why do some people have cancer?

The only other point requiring mention which came out clearly at the Congress is the substantial practical advance which has been made in treatment by radium. By dispersing the radium throughout the substance of the tumour and in its neighbourhood, and by using small doses for long times rather than large doses for short times, there is no doubt that a good many cases of cancer can be cured, and most material alleviation can be secured in cases which have progressed too far to stop. At the same time, there is no justification for any talk about surgery being eliminated. The present price of radium seems to need some justification. How it operates is still not understood. The radiations may act better than other differential killing agents because of their nature or because they impinge continually upon the tissues without being too concentrated at their point of origin: like other harmful agents, they kill the cells of tumours more easily than those of normal tissues.

The International Research Council.

THE fourth General Assembly of the International Research Council was held at Brussels on Friday, July 13. M. Picard, president of the Council, presided, and the meeting was attended by delegates from most of the countries adhering to the Council. A meeting of the executive committee had been held on the previous Wednesday. The report of the general secretary, Sir Arthur Schuster, was presented, and a number of resolutions adopted. The report showed that at the conclusion of the extraordinary general meeting in June 1926, the secretary had taken

steps to inform the nations concerned of the unanimous decision to invite Germany, Austria, Hungary, and Bulgaria to join the Council and the Unions attached to it.

Austria, Hungary, and Bulgaria each possess an Academy, which is the recognised authority in scientific matters, and invitations were sent to each of these; at the same time their diplomatic representatives in London were informed. In the case of Germany there is no single representative Academy. The Foreign Office in London was consulted, and by its advice an invitation to join was

transmitted to the German Government through the British representative in Berlin. Letters were, in addition, addressed to the Academies of Berlin, Göttingen, Leipzig, and Munich. It was not realised at the time that there is now a fifth German academy at Heidelberg.

The Austrian Academy of Sciences intimated through the Austrian Legation that it considers the unanimous invitation extended to Austria and Germany as an important step in the direction of a re-establishment of normal co-operation between scientific workers of all nations. In view of the fact that the Academy of Sciences is affiliated to the Verband der Deutschen Akademien, a final reply can only be given later after consultation with the members of that body. It appears, however, that the Geodetic Commission of Austria is interesting itself in the matter, and is taking steps which may lead to the adhesion of that country. The reply from Bulgaria, through the Legation in London, thanked the Council for the invitation, but expressed regret at being unable, for purposes of economy, to share in international scientific work. From Hungary a cordial and immediate reply was received, and in due course Hungary formally adhered to the Council. From Germany no definite reply has reached the secretary, but it appears that the central government has submitted the question of acceptance to the Verband der Deutschen Akademien. It is understood that objections have been raised by this body on the grounds that the International Research Council is an Association of governments rather than of scientific bodies.

In this connexion it is pointed out in the report that of the thirty-five countries adhering to the Council, fourteen are represented by their scientific academies and six by national research councils specially constituted for the purpose, composed of representatives of the national academies; these are as independent of government control as the academies themselves. Among these are the United States of America, Italy, and Japan; while of the remaining fifteen, Latvia is represented by its Chemical Society, and seven by some scientific department connected with the government. In seven cases only is the government the controlling body.

Since in practically all cases the funds are found from government sources for the administrative work of the Council itself, some link with the government of a country is required, but for the scientific work carried out by the Unions each properly accredited delegate has one vote and there is complete freedom. It is quite open to the five German academies to form a national research council which could then adhere to the International Research Council.

The convention, under which the Council works, comes to an end, unless previously renewed, in 1931. In view of this fact the Royal Society had given notice of a resolution in the following terms:

"The Council of the Royal Society have had under consideration the fact that the Convention under which the International Research Council is con-

stituted lapses, unless renewed previously, on 31st December 1931.

"They realise that the renewal of the Convention will carry with it changes in certain of the Statutes, and that the whole question will involve a full and careful consideration of the circumstances by the Nations adhering to the Council. They consider it important that a representative Committee should be appointed at the forthcoming Meeting of the Council next July to consider and report on the matter some considerable time before the Meeting in 1931, at which a definite decision must be taken, and further that a general discussion should take place this year in order that the Committee, if appointed, might have before it a general impression of the views of the Delegates on this subject.

"The Royal Society therefore give notice that its Delegates to the Meeting of the International Research Council will propose:

"(1) That a Committee be appointed to consider what changes, if any, should be introduced in the Statutes of the International Research Council and its Unions to take effect on the expiration of the present Convention (31st December 1931).

"(2) That for this purpose the Committee shall enter into communication with the Unions, the Bodies adhering to the Council and such other bodies and persons as it may consider advisable, and present a Report to the Executive Committee of the Council not later than 30th June 1930."

Italy had also given notice of its intention to raise the same question, while previously to the meeting the resolution of the Royal Society had been supported by the United States, Spain, Holland, and Czechoslovakia.

After discussion by the Council the resolution of the Royal Society was accepted unanimously, and at an adjourned meeting a representative committee of fourteen members was appointed, with Sir Henry Lyons, one of the Royal Society delegates, as its secretary.

A further resolution, moved on behalf of the Royal Society, dealt with a matter which has been causing some difficulty. According to the statutes of the Council, any change in the statutes of one of the Unions requires the approval of the Council before becoming effective, and this leads to delay, since the Council only holds triennial meetings. To meet this difficulty it was agreed to delegate to the executive committee, during the interval between two assemblies, the duty of approving changes proposed in the statutes of a Union, provided those changes were in accord with the statutes of the Council.

Certain questions as to the method of stating the amounts due from a country to the Council or its Unions were left to the secretary to deal with, and the necessary action was taken with regard to other minor questions which had been raised.

Two vacancies on the executive committee were filled by the re-election of Signor Volterra as a vice-president, and Sir Arthur Schuster as general secretary, and the meeting terminated with a vote of thanks to the president.