National Argentine Observatory in Cordoba, presents a catalogue of 5791 stars. The work is the outcome of 28,718 observations made with the 5-in. Repsold meridian circle during the six years 1885–90. The observations are of a general nature over the southern sky, and form a continuation of the general catalogue. Auwers's list of 303 fundamental stars was observed in 1889 by Prof. Updegraff, and the results are included in this catalogue. There is also included a list of sixty-three comparison stars for the minor planet Victoria, observed in 1889 by Prof. Updegraff, and this is given separately, in addition to being included in the regular catalogue. There was no unusual change or condition of the meridian circle during the period mentioned, so far as is known, and the reductions were made in precisely the same manner and with the same system of constants as in the general catalogue. The catalogue also includes the results of a comparison with Boss's Preliminary General Catalogue of the stars common to both.

THE MILKY WAY AND THE DISTRIBUTION OF STARS WITH PECULIAR SPECTRA.—The distribution with reference to the galaxy of the many stars having peculiar spectra classed by the late Mrs. Fleming has been analysed by Mr. T. E. Espin, and the results appear in the March-April number of the Journal of the Royal Astronomical Society. The distribution evidence suggests that the order A, F, G, K, M of the Harvard classification of stellar spectra requires rearranging thus, A, G, M, K, F. The author makes some interesting speculations on the structure of the galactic system.

THE MICROSCOPE SUBSTAGE AND ITS ADJUSTMENTS.

THERE are one or two points, particularly in the substage arrangements, which are distinct and characteristic of English and Continental microscopes. In the English instrument of any pretensions it has always been the custom to provide a centring substage, and this carries both the optical portion of the substage condenser and the iris diaphragm. It has to be assumed, therefore, that the iris diaphragm is centred permanently and accurately to the optic axis of the substage condenser, its perfection therefore depending on the extent to which this assumption is justified.

In the case of the Continental microscope, where a centring substage condenser is provided, it is mounted so that the optical part is centred independently of the iris diaphragm, the latter, in fact, being mounted below the substage condenser and having certain adjustments which are in no way connected with the centring arrangement. It therefore follows that in the Continental type the iris diaphragm may be, and indeed often is, permanently out of centre with the optic axis of the objective. The substage condenser has therefore to be centred in relation to two axes, the centre of the iris diaphragm and the optic axis of the objective, which themselves are not in exact alignment. It is obvious that under such conditions the provision and use of a centring appliance for the adjustment of the optical part of the condenser will never result in correct alignment of the various parts. With the object of overcoming this defect, at least in part, some of the better Continental models have been provided with an independent adjustment to enable the mechanic to centre the condenser to the optic axis, after he has centred the iris diaphragm. The condenser is mounted in a ring provided with three screws, the setting of which admits of the optical part of the condenser being centred, but this is, of course, not an adjustment of which the average user would care to avail himself. In the English arrangement, where the iris diaphragm is correctly centred to the substage condenser, centration of the whole substage fitting results in correct alignment with the remainder of the optical system of the microscope.

For the most critical work, therefore, it would appear that the English method is to be preferred. On the other hand, where a microscope is being used for laboratory work, and is only occasionally being used for the testing of objectives or for critical purposes, there is no doubt that the Continental type has much to recommend it. The fact that the iris diaphragm may be contracted to any desired degree, and may then be shifted laterally so that oblique illumination in any azimuth and in any zone of the field of view can be obtained at will, is a great convenience, and for anything like rapid testing of objectives is almost essential.

In the English stand it becomes necessary to provide stops of various sizes and shapes, which can be placed at the back of the substage condenser, to enable oblique illumination to be obtained in any desired manner.

Where absolute accuracy is required it would appear that an arrangement in which both substage condenser and iris diaphragm are capable of independent centration might be a desideratum. In such a case the iris diaphragm would be centred first, and then the optical part of the substage condenser introduced, and that centred independently. By this means the iris diaphragm, the substage condenser, and the objective would be in exact alignment, and the arrangement would be such that work of the most critical character could be carried out. It must be admitted, however, that the conditions under which such a method would become necessary rarely, if ever, arise, so that a well-made instrument provided with the Continental type of substage, in which the iris diaphragm may be decentred, is a very desirable adjunct to any good microscope.

As an indication of the perhaps unnecessary elaboration that has obtained in English stands, one may mention the provision of a fine adjustment to the substage condenser. It is difficult to conceive under what conditions this becomes necessary. A well-made rackwork should provide all the accuracy of adjustment that is required. If it does not it either implies that the mechanical construction of the microscope leaves something to be desired, or that the user has not acquired the necessary manipulative skill to focus his substage condenser with sufficient accuracy, the latter alternative being the more probable.

AUSTRALIAN METEOROLOGY.

THE Australian Meteorological Bureau has issued a series of interesting maps showing the normal distribution of temperature and rainfall over the Australian continent. The variety of climate which Australia offers is well illustrated by these charts. The mean summer temperature of the south coast of Victoria (between 60° and 65° F. for January) is about the same as the mean summer temperature of London, while 400 miles to the north the heat is tropical, with a mean temperature of more than 80° F., increasing to more than 85° F. in the greater part of the north-west and central regions. The trend of the isotherms near the coasts shows the usual oceanic effect; they bend southwards in the winter and northwards in the summer in passing from continent to ocean. The isotherms are closest together near the southern coast in summer and near the northern coast in winter.

A fault which might be remedied in future issues is the omission of any scale of distances or parallels of latitude and longitude from the charts.

The rainfall charts have been compiled from data extending over twenty to forty years, with a few stations with only fifteen years' record, indicating that, meteorologically at any rate, Australia is no longer in relative infancy. During the summer months, when the variation of temperature is most rapid near the south coast, the rainfall is greatest on the north and north-east coasts, and the isohyets are closest together in these regions. The distribution gradually changes, and during the winter months the rainfall and its variation are greatest in the south and south-east districts. The change in the position of the isohyets from month to month is very regular; the motion is similar to that of a pendulum, the distribution in the warm months being at one end of the swing and that in the cold months at the other.

In New South Wales, at Forbes, near the centre of gravity of Australia's population, and not far from the site of the new Federal capital, there is practically no variation in the rainfall from month to month; each month has about 2 in. of rainfall. Utilising this fact and the regularity of the change for other regions, the Commonwealth Meteorologist has constructed a rainfall "clock." Isohyets of appropriate shape are drawn on a card placed beneath another card with the outline of Australia cut out of it. The lower card is rotated about an axis through Forbes, and as it moves the rainfall distribution for different months appears, the appropriate positions for each month being shown by an index mark. The remarkable regularity which renders possible this simple device leads the Commonwealth Meteorologist to suggest that Australian meteorology may be of such importance for general investigations as to warrant the establishment of observatories there, internationally supported and controlled. E. G.

THE RESEARCH DEFENCE SOCIETY.

THE Research Defence Society held its annual general meeting on Tuesday, June 24, at the Royal College of Physicians. The chair was taken by the president of the society, Sir David Gill, and there was a very large attendance. The speakers were:—Bishop Frodsham, founder of the Australian Institute of Tropical Medicine; Sir Thomas Barlow, president of the Royal College of Physicians; Lord Cromer, Sir Hugh Bell, and Mr. Waldorf Astor. The report, presented by Mr. Sydney Holland, chairman of committee, gave a good account of the society's work during the past year with special reference to the campaign against anti-vivisection shops. It stated also that the council of the Royal Society for the Prevention of Cruelty to Animals is sending out a referendum to all the members of that society. The point is, whether it was right or wrong to reject Lord Cheylesmore from the council of the Royal Society for the Prevention of Cruelty to Animals on the ground that he is a vice-president of the Research Defence Society. Seeing the advantages which animals have gained from experiments on animals, and the many restrictions placed on experiments on animals in this country, we think that a man may very properly hold office in both societies; and we are glad that Lord Cromer and Sir Hugh Bell spoke very strongly on this point.

Mr. Waldorf Astor, in an admirable speech, referred to the good news, this week, that the Government has allotted 57,000*l.* annually to research in relation to tuberculosis, and has appointed the Committee and the Advisory Council for this great work. Sir Thomas Barlow spoke of that unity of purpose which is between the men of science and the men in practice: how the doctor and the surgeon are indeed guided and helped by the physiologists and pathologists. Bishop Frodsham spoke of the Christianity of all work done, carefully and wisely, for the relief of suffering humanity; and, as Bishop of North Queensland, he has seen more than most of us of the misery caused by certain obscure tropical diseases, and has done more than most of us to alleviate it. Thus the subject which the Research Defence Society exists to popularise was presented from diverse points of view. Take what point of view we will, it is a subject of national importance.

THE BELFAST MEMORIAL TO LORD KELVIN.

THE statue of Lord Kelvin which has been subscribed for by the citizens of Belfast was unveiled by Sir Joseph Larmor, M.P., F.R.S., on Thursday last, June 19, in the presence of a large and distinguished gathering. The Chancellor of the Queen's University (the Earl of Shaftesbury, K.P.) presided, and the attendance included the Lady Mayoress of Belfast, the Vice-Chancellor of the Queen's University of Belfast, members of the Senate of Queen's University, and many of the leading citizens of Belfast.

In the course of his remarks, the chairman said that from the time of the death of Lord Kelvin the wish was uppermost in his (Lord Shaftesbury's) mind —as indeed he felt sure it was in the mind of everyone present—that there should be erected within the city of Belfast a fitting memorial to a man whose fame had gained for him a paramount position in the city of his birth and in the city with which he and his family were so intimately connected, as well as in the whole world. That day they were to see the consummation of their aspirations, and he offered his warmest thanks to Sir Joseph Larmor, who had so kindly come to perform the unveiling ceremony.

Sir Joseph Larmor then delivered an address, of which the main part is subjoined:—

I am deputed to represent on this occasion a company of subscribers, our fellow-citizens, who have thought it right that the genius of Lord Kelvin, and the great activities which kept him in the forefront of the advance of physical science in an age in which it has transformed the world, should receive permanent commemoration in the city of his birth and parentage, in the community among whom he passed the early years of his life, and to whom, in his later years, he put in an almost passionate claim that he belonged. We do not forget how profoundly he was moulded by the great city of Glasgow, with which his active career was so conspicuously associated. The intimate conferences from his early manhood with the pioneers of industrial development such as that city has possessed ever since the days of James Watt—discussions along the lines of unfolding problems of mechanical power, of naval construction, of the art of navigation—were just what was required to develop the student and natural philosopher into his other aspect, more familiar to the world at large, as the prophet and guide in the utilisation of the vast opportunities opened up, for the practical convenience of life, by modern scientific discovery. By no amount of mere natural ingenuity, after the manner of an inventor or a man of affairs, could anyone have attained to this position; an essential condition was sustained intellectual discipline such as Lord Kelvin enjoyed from his early years.