

was agreed, should be given as "true" only, and from 0° to 360° measured clockwise.

The arrangement of the British "Notice to Mariners" met with universal approval, and its form was adopted as the standard for all countries.

With regard to the "Light Lists," the principal alterations and additions agreed to were the inclusion in the lists of "light buoys," "wireless direction-finding stations," and "sound-ranging signal stations." The desirability of finding a satisfactory formula for describing visibility as limited by the intensity of light was recognised, and it was agreed that each nation should make observations and collect data in order that the matter might be dealt with by the International Hydrographic Bureau if ultimately established.

The subject of "Tides" was carefully considered, and the necessity recognised for the adoption of a uniform zero from which heights should be measured, which should also be the datum for soundings on the charts, and of uniform methods of publishing tidal information. A rule for determining a "universal datum plane," to be called "international low water," was suggested for the further consideration of hydrographers, and decisions were reached regarding information to be published in tide tables, and on charts at places where the semi-diurnal tide predominates, but it was unfortunately found that modern tidal knowledge was insufficient for any recommendation to be made as to information which should be given on charts at places where the semi-diurnal is not the predominating tide-wave; this question was therefore left for further investigation.

Interchange of publications, a most important matter to all countries, as each country freely copies the publications of the others, received consideration, and steps were taken to put the matter on a more satisfactory footing.

A number of instruments used by various countries in hydrographic surveying were exhibited, and useful comparisons made and information exchanged.

The adoption by all countries of a system of "time zones" to regulate the time kept at sea, such as have already been adopted by France, Great Britain, and Italy, was recommended.

The last item on the programme of the conference was the establishment of an "International Hydrographic Bureau," and as the work of the conference progressed, the necessity for such an institution became more and more evident. Questions arose upon which an agreement in principle was arrived at, but time would not permit of the necessary details to give effect to the decisions being worked out by the conference, nor was such a large body as the latter found to be a suitable medium for doing so. On the necessity for the establishment of a bureau, which should be a purely advisory body with no executive powers, and of the existence of sufficient work to employ it, there was unanimous agreement. Such a body, it was felt, was urgently required to consider and

make proposals for the co-ordination of the work of the whole of the Hydrographic Offices, to study the numerous questions not fully solved by the conference, to act as an authority to which questions could be submitted for advice, to take steps as required to obtain the assistance and co-operation of Governments and Hydrographic Offices when required for the execution of any particular work or research desirable in the common interests of all countries, and generally to watch over and advance the science of hydrography. As a result of its deliberations the conference decided to appoint a committee consisting of Rear-Admiral Sir J. F. Parry, K.C.B. (then Hydrographer of the British Navy), Monsieur J. Renaud, the French Hydrographer, and Rear-Admiral E. Simpson, the Hydrographer of the United States Navy, to prepare for presentation to the various Governments the case for the establishment of a bureau, and to take the necessary steps for its formation when the various countries should have signified their approval of its institution.

With this final act the conference concluded its labours, which, from a hydrographical point of view, cannot be over-estimated, and the results of which will, it is hoped, speedily be apparent in the publications of the various Hydrographic Offices.

A SHAKESPEAREAN GARDEN.

WE learn with interest that the trustees and guardians of Shakespeare's birthplace are laying out the "Great Garden" attached to his house, "New Place," as an Elizabethan garden. The trustees are naturally anxious to plant the garden with those old-fashioned flowers which were grown in English gardens in Shakespeare's day, and they appeal to lovers of Shakespeare and of gardens to help them by contributing the flowers needed to restore the garden, so far as possible, to its original aspect.

Such a garden of old-fashioned flowers is much to be desired in these days, when so many of the old-fashioned, beautiful, sweet-scented flowers are almost lost to cultivation in gardens, owing to their being ousted by the modern creations of florists. No doubt present-day flowers are larger and more brilliant, but we have to a great extent lost the charm, scent, and elegance of the old garden flowers as a result of what may be termed the vulgarity of present-day tastes.

The desire for masses of colour and for magnificence of form no doubt accounts for the lack of interest in the old-fashioned plants, many of which are now scarcely known. Among the plants which the trustees desire to obtain are "sweet musk roses," "roses damask'd red and white," the "crimson rose" and "milk-white rose," all alluded to by Shakespeare. Crown imperials, "lilies of all kinds"—but those known in Shakespeare's time were only a tithe of what are now found in gardens; daffodils—again only a few—and "fleur-de-luce" are all referred to by Shake-

spare, and may be sent. Of shrubs, rosemary, lavender, lavender cotton, box, woodbine, and many others should be planted.

The trustees, in their circular, refer to several early gardening books which give accounts of the plants in cultivation in the latter part of the sixteenth century, but they omit to mention the excellent book by the late Canon Ellacombe, a keen student of Shakespeare, whose "Plant-lore and Garden Craft of Shakespeare" is a mine of useful information on the plants in cultivation in Shakespeare's day. The list of plants grown in the garden at Bitton vicarage in 1831, reprinted in the recently published memoir of Canon Ellacombe, might also well represent what would have been found in a garden three hundred years ago, and should be referred to by those anxious to assist in the good work.

Fortunately, there are still collections of the old roses from which it may be possible to supply plants for the "Great Garden." Anyone having any of the old-fashioned plants suitable for the garden should send them to Mr. Frederick C. Wellstood, secretary to the trust, Shakespeare's Great Garden, New Place, Stratford-on-Avon, by whom they will be gratefully acknowledged. The names of the donors will be preserved at Nash's House, adjoining New Place, which was once the property of Thomas Nash, the husband of Shakespeare's granddaughter Elizabeth.

There are probably many people who would wish to take part in this interesting tribute to Shakespeare's memory, but have no flowers to send; contributions in money from such will be equally acceptable, and should be sent to the secretary to the trust.

A RESEARCH INSTITUTE FOR NEW ZEALAND.

UNDER the will of the late Thomas Cawthorn, of Nelson, New Zealand, the sum of 240,000l. was left for the founding of a technical institute. The trustees were unanimous in desiring that the Cawthorn Institute should be a research institution, and appointed a private commission of scientific men to advise as to the best method of procedure. The commission consisted of Sir J. C. Wilson, President of the N.Z. Board of Agriculture, Profs. Benham, Easterfield, Marshall, and Worley, and Dr. Leonard Cockayne. At the request of the trustees, the commissioners have consented to become an honorary advisory board. The main recommendations of the commission have been adopted by the trustees. The chief work of the institute is to be "instruction in and performance of scientific research; such research to be definitely related to the industries of Nelson and of the Dominion."

A beautiful, well-wooded site overlooking Tasman Bay has been secured, the area being approximately 20 acres and the distance from Nelson about three miles. It is expected that the buildings will be commenced at an early date. At the last meeting of the trustees it was decided, with

NO. 2618, VOL. 104]

the approval of the advisory board, to offer the position of director to Prof. T. H. Easterfield, professor of chemistry at Victoria College (University of New Zealand), Wellington, who has accepted the position. Mr. T. Rigg, of the Cambridge School of Agriculture, a New Zealand 1851 Exhibitioner, has been appointed agricultural chemist; other staff appointments will be made shortly.

A liberal scheme of scholarships and fellowships is arranged, so that university graduates may be attracted to carry out investigations under the guidance of members of the staff.

An annual "Cawthorn Lecture" has been established. The 1917 lecture was delivered by Prof. Easterfield on "The Aims and Ideals of the Cawthorn Institute"; the next lecturer was Prof. Benham, and the lecturer in 1919 was Dr. L. Cockayne.

Questions having been raised as to the legal right of the trustees to establish a research institute, an originating summons was taken out under the Declaratory Judgments Act. The decision of Mr. Justice Chapman was to the effect that the scheme set out in the report of the commissioners falls, in its main features, within the terms of the testator's intentions. It is proposed to introduce a Bill embodying the chief points of the judgment in the New Zealand Parliament next session.

Though it is intended that the work of the institute is to have a distinct economic bearing, it has been made clear that the trustees recognise that no sharp line can be drawn between technical and scientific research, and that the term "technical" will be understood in a broad and liberal sense.

DR. CYRIL G. HOPKINS.

STUDENTS of agricultural science in all countries will learn with regret of the death on October 6 of Dr. Cyril G. Hopkins, the distinguished head of the department of agronomy in the University of Illinois. Dr. Hopkins had for the past twelve months been studying the exhausted soils of Greece under the auspices of the American Red Cross. He had written his report, seen it translated into Greek, and received a decoration from the King of the Hellenes. He was on his way home, but when three days out from Gibraltar was suddenly struck down with congestion of the brain, with malarial complications.

Dr. Hopkins's chief service to agriculture was his urgent and persistent advocacy of the need for the honest and adequate use of fertilisers. His region of operations was the State of Illinois, of which he had a very extensive knowledge. It was the present writer's privilege to accompany him on an agricultural tour through this State in 1912, and to learn at first hand some of his interesting agricultural deductions and conclusions. Dr. Hopkins's critical scientific outlook was manifested in his lectures and writings. Besides being popular with his students, he had a great faculty for getting on well with farmers, and was obviously a welcome guest in their homes. English agri-