

These group activities are overshadowed by the extensive personal contacts between professionals who exchange correspondence, visit each other's laboratories and co-author papers presenting joint research findings. Some measure of the extent of this collaboration is given by a study of co-authorship patterns based upon the 1973 Science Citation Index. About one paper in thirty is co-authored by scientists of different nations, the highest level being attained in the Earth/Space Sciences where 4.5 percent are co-authored. 10.4 percent of Canadian papers are produced as the result of international collaboration.

The many private informal contacts are further enhanced by an extensive network of scientific and technical publications. Taken all together these international activities represent the single most important contribution to the health of Canada's science and technology and they are, moreover, carried on with very little demand upon the public purse.

Institution to Institution

Institutional collaboration, as its name implies, is a joint undertaking between organizations as distinct from individual scientists: teams of researchers, laboratories or agencies working in the same field or even two nations sharing similar problems and aspirations. Such associations form the backbone of international collaboration in S&T; because they are usually undertaken on a bilateral basis, they offer the benefits of joint activity with many of the inherent difficulties of international collaboration reduced by the involvement of only two partners. Thus, objectives can usually be more accurately matched, management and decision taking made easier and equitable benefit sharing less difficult.

For Canada, a major activity which might loosely be classed as bilateral is the joint US/Canada membership held in many North American scientific and professional societies. These memberships and similar close links between individual Canadian and American societies - and to a lesser extent between Canadian and other foreign societies - offer an invaluable source of new ideas and inspiration. Such non-governmental links are paralleled by the numerous bilateral relations existing between government laboratories and agencies, relations which have by and large proven to be some of the most satisfactory types of formal international collaborative agreement. They and the related general government-to-government bilateral agreements are dealt with in detail in Part II of this paper.