1 April 1932 (Ed N. Harrison, pers. comm.). A male was collected on East San Benito Island by G. Willett on 2 April 1938 (Los Angeles Co. Mus. Nat. Hist. no. 19213); an annotation "br." on the label presumably refers to gonad size and not to the actual presence of a nest. There are no subsequent reports. Banks (1964) found no birds "despite a thorough search" of all islands on 18–19 April 1963, and he felt that the species was probably extinct.

I have recently visited the San Benitos on several occasions and have made special attempts to locate this species. On 13–14 April 1969 L. C. Binford and I explored all of the islands except the western half of West Benito but found no finches. A small group of fishermen inhabited the village on West Benito and house finches, if present, would have been expected in the vicinity. On 5 February 1970 M. N. Kirven and I explored all of West Benito Island with negative results; the fishing camp was deserted. On 19–20 April 1970 I searched all three islands, again with negative results; many fishermen inhabited the village. Members of the staff of the San Diego Natural History Museum visited West Benito Island nine times at almost weekly intervals 1 January–15 March 1971; I was present on 18 January, 1 March, and 15 March. The entire island was surveyed on nearly all of these visits, and no house finches were observed. Yet, on each occasion the endemic race of the Savannah Sparrow (*Passerculus sandwichensis sanctorum*) was abundant, particularly in the village where it was a dooryard bird. During this period 5–20 fishermen resided in the village.

Since house finches are noisy and conspicuous birds, especially in the breeding season, it is certain that *Carpodacus mcgregori* no longer inhabits the San Benitos, and that it disappeared between 1938 and 1963. It has been reported twice from Cedros Island (Grinnell 1928), most recently in 1925 (specimen in Mus. Vert. Zool.), but the chance that it still exists on that rugged and poorly-explored island, where *Carpodacus mexicanus* is common, seems slight.

Why McGregor's House Finch disappeared from the San Benitos is unknown. Because it evidently coexisted with *P. s. sanctorum* for millenia, the possible competitive exclusion of finches by sparrows cannot be considered seriously. Anthony (1925) attributed its decline to cats introduced by fishermen, but that explanation is inadequate because the birds persisted for another decade, and because Savannah Sparrows, which would have been easy game, suffered no apparent decrease. Despite the presence of cats on Guadalupe Island, another house finch, *Carpodacus amplus*, remains abundant. At present there is no evidence of feral cats on the Benitos.

Carpodacus mcgregori was never abundant, and its skins and eggs were highly desired. In view of the extensive and at times excessive collecting that took place on islands off northwestern Baja California in the early decades of this century, the activities of collectors and "oologists" could have played an important role in its elimination. Apparently the endemic Savannah Sparrow has always been abundant enough to withstand the demands of science (Kaeding 1905: 136; Bancroft 1932:89).

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A TECHNIQUE FOR PERFORMING LAPAROTOMY ON SMALL BIRDS

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Domestic fowl have long been castrated to improve flesh qualities and reduce aggressiveness. The testes are exposed for removal by surgically opening the abdominal wall, a procedure called laparotomy. Although references are often made to this operation in experiments with wild birds, it has not been described in detail. Miller (1958, 1968) found laparotomy a convenient way to examine the reproductive structures of living birds in the field. Nembutal was used as an anesthetic. He routinely laparotomized captured wild Andean Sparrows (*Zonotrichia capensis*) without any losses, and released them after an hour in captivity. He reported that they immediately resumed normal behavior relative to their mates and neighbors. Gathering sequential data on gonadal changes by laparotomy eliminated the need to sacrifice birds during the breeding season. In addition to being used to monitor temporal changes in gonad size, laparotomy can also be used to determine the sex of sexually monomorphic species, and to provide access to the peritoneal cavity for implantation of electronic sensing devices.

During the course of experiments on European Starlings (*Sturnus vulgaris*), over 1500 laparotomies were performed on both sexes over a period of six months, usually at 14-day intervals. No deaths occurred which were directly attributed to the operation, and no infections developed, despite somewhat aseptic conditions.

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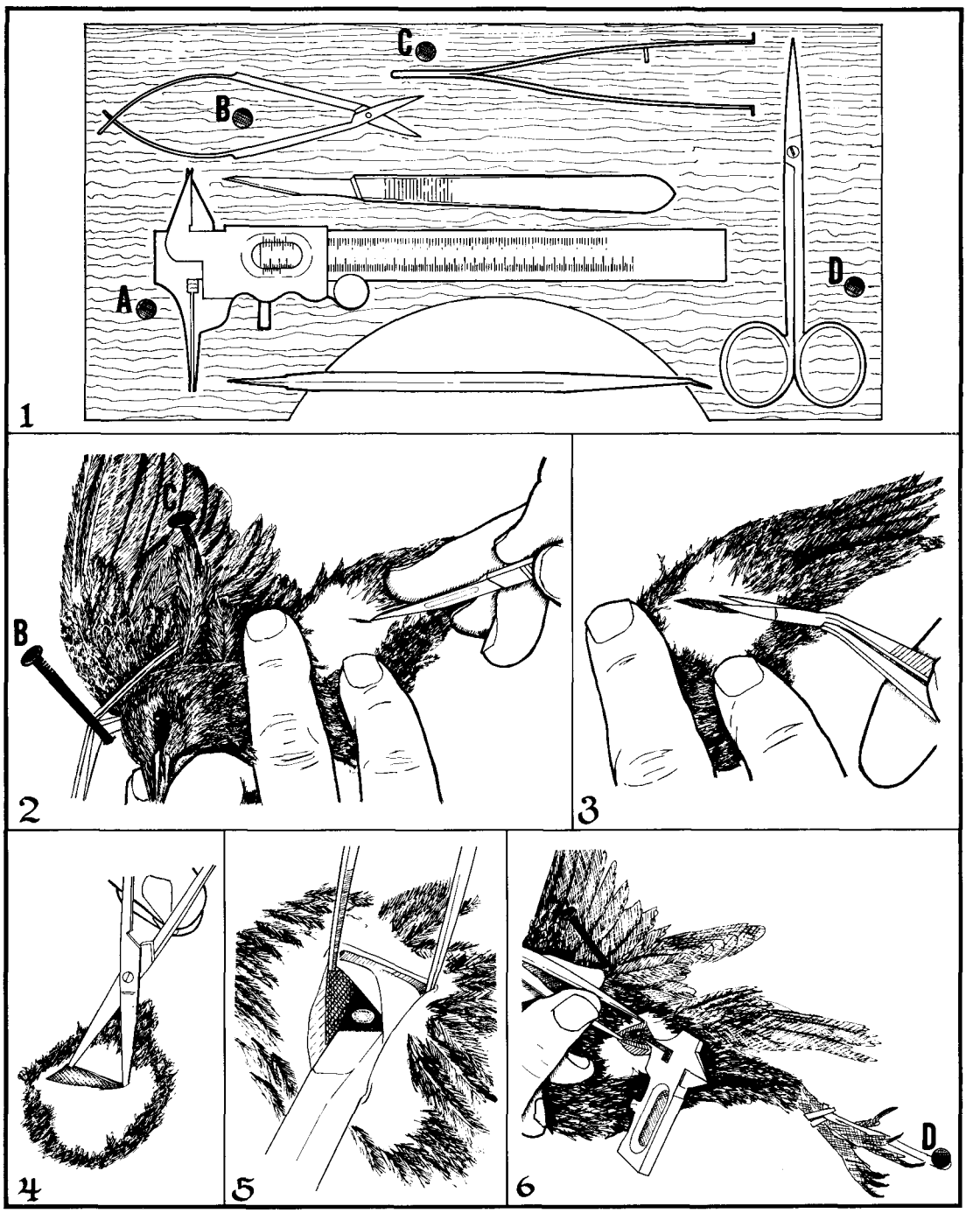

FIGURE 1. Equipment and technique for performing unilateral laparotomy.

The equipment used for the operation includes the following:

Dissecting scissors—115 mm long with 35 mm cutting edge, sharp, pointed, straight

McClure iris scissors—115 mm long, extremely fine point

Dissecting forceps—115 mm long, medium point, with tips bent outward about 2 mm (referred to as dilator forceps)

Vernier calipers—with tips ground to fine point, as illustrated

Probe—with one end pointed, the other square, blunt

Scalpel

Insect forceps

Restraining board—about 140 cm × 280 cm with nails positioned as illustrated (fig. 1, no. 1)

Adjustable head lamp or dissecting lamp

Absorbent cotton
Ethanol
Zephiran antiseptic solution

The following procedure for laparotomy on the left side was adopted to decrease the amount of time each bird was restrained to obtain gonadal measurements. No anesthetic is necessary, but ethyl chloride (a nontoxic skin refrigerant for topical anesthesia), applied at the incision sites and left for about 5 sec, will prevent any discomfort to the bird.

Step 1. The bird is held in the left hand with its feet projecting to the right. A 5-cm rubber band secures the feet and is looped over nail D (fig. 1, no. 6) on the restraining board. The left hand is then moved anteriorly along the body. The wings are grasped, extended over the back, and held together in that position perpendicular to the back. A 12-cm rubber band is looped around both wings close to the body. The wings, still held together over the back, are placed between nails B and C (fig. 1, no. 2), and the band passed outside nail B and looped over nail A. Another 5-cm rubber band is looped over nails A and C and pressed down close to the wings. A twist is made in this band between A and B and the starling's bill inserted in the twist to restrain head movements. The rubber band should not obstruct the external nares.

Step 2. Ethanol is squirted on the left lateral-abdominal region anterior to the thigh, and then alcohol-soaked cotton is used to swab this area and expose the skin. A few of the small anterior feathers of the femoral pterlya are removed. Then, with the left index finger, the bird's skin is moved anteriorly over the ribs, and a small incision is made in the skin with the scalpel just dorsal and anterior to the femoral pterlya and just anterior to the underlying sartorius muscle (fig. 1, no. 2). This incision is extended dorsally with the iris scissors until it is 10–15 mm long (fig. 1, no. 3).

Step 3. The probe is inserted through the skin incision, and the sartorius muscle is pushed posteriorly where it adheres to the lateral body wall so that the intercostal region between the last two ribs can be located.

Step 4. Sharp-pointed dissecting scissors are then held in the right hand, on the thumb and index finger, with the points oriented toward the palm. Since the sartorius muscle has a tendency to slide back into its original position, the scissor tips are used to push it aside; at the same time the tips are manipulated until they press against the intercostal area anterior to the last rib. Firm pressure and slight back and forth movement allow the tips to penetrate the tissue. The tips of the scissors are then spread apart about 12 mm (fig. 1, no. 4), thus exposing the abdominal cavity. If the tips of the scissors are pushed too deeply, the viscera may be punctured. If the incision is extended too far dorsally or anteriorly, kidney injury or air sac disruption may result.

Step 5. The closed tips of the dilating forceps are then inserted through the incision between the two ribs and allowed to spring open (fig. 1, no. 5). By holding the forceps between the left thumb and forefinger, and gently resting the other fingers of the left hand on the bird's breast (fig. 1, no. 6) the right hand is free to manipulate other instruments through the incision.

Step 6. Insect forceps are used to make a small tear in the mesentery supporting the intestines. A blunt probe is then used to tear the mesentery further and to push the intestines ventrally so the gonads can be observed.

If gonadal measurements are to be taken, the probe is removed, and the caliper tips are carefully manipulated into the abdominal cavity (fig. 1, no. 6). The diameter of the largest ovarian follicles can be measured early in the breeding season, but because of the rapid maturation of follicles later in the season and their extreme size just prior to ovulation, caution must be exercised to avoid disturbing the membranes surrounding the ova. Greatest testicular length and width can be obtained on the inactive organ, but during the peak of breeding activity, it may be practical to obtain only the greatest width, and calculate other organ parameters from this (Berthold 1967; Payne 1967). It may also be desirable, depending upon the purpose of the experiment, to correlate testicular measurements with the particular histological stages of spermatogenesis (Bullough 1946; Bartholomew 1949). This, of course, demands that a sample of animals be sacrificed for preservation and sectioning of material or a unilateral castration be performed (Hamner 1966). Selinger and Bermant (1967) describe a method for performing gonadectomy on quail.

Step 7. The incision is closed by simply removing the dilating forceps. No sutures of any sort are used to close the incisions. After gently swabbing the area with Zephiran, the bird can be removed from the restraining board. In normal standing posture, the thigh musculature effectively covers the incision between the ribs. Occasionally, an air bubble develops, caused by an air sac disruption, creating a bulge under the skin after healing. This bubble will eventually disappear but can be lanced with a sharp scalpel to reduce pressure if it proves to be an immediate detriment to the locomotion of the experimental bird. Generally the wound heals rapidly and healing is complete in about two weeks.

Starlings subjected to unilateral laparotomy have been observed to resume normal activity, even bathing, immediately upon release in a cage. The operation apparently has no overt effect on the normal behavioral events in their reproductive cycle. Hamner (1968) has shown that laparotomies at 4-day intervals did not alter the testicular cycle of the House Finch, *Carpodacus mexicanus*. The use of a fast-acting local anesthetic, and elimination of sutures, as described in this paper, significantly reduces the amount of time the bird is restrained. If the surgery is carefully performed, there is little or no bleeding and only momentary discomfort to the bird. With some experience, the entire procedure of laparotomy and gonadal measurement requires less than 90 sec. One can even become dexterous enough to perform the operation while holding the bird in one hand, but the restraint method described here is recommended when measurements of a large number of birds are to be made.

Before laparotomies are performed routinely on valuable experimental birds, it is advisable that the investigator practice on expendable birds of the same species or at least a species of similar dimensions.

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IMPORTANT BIRDS FROM BLUE POINT COTTONWOODS, MARICOPA COUNTY, ARIZONA

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The Salt River currently consists of four basic divisions: deeply channeled river from Roosevelt Lake upstream, irrigation reservoirs from that point downstream to Stewart Mountain Dam, dry river channel from Granite Reef Dam downstream to the confluence with the Gila River, and the fourth area, a short segment from Stewart Mountain Dam to Granite Reef Diversion Dam (about 10 miles long) representing what little remains of the native river. During the 1970's this portion is scheduled to be inundated by Orme Reservoir, part of the Central Arizona Project.

Blue Point Cottonwoods, located approximately 2 miles upstream from the confluence of the Verde with the Salt River, is the only large stand of mature cottonwoods (*Populus fremontii*), with its attendant mesquite (*Prosopis juliflora*) understory, left on the entire Salt River. These cottonwoods will be covered by Orme Lake, thus virtually completing the extirpation of native riparian groves along the Salt River. This virgin grove extends for nearly a mile along the north side of the river. A narrow marsh of open water approximately one-half mile long, edged with arrowweed (*Pluchea sericea*) and salt-cedar (*Tamarix* sp.), and containing several dense stands of cattails (*Typha domingensis*) contributes to the diversity of the habitat. *Azolla* sp., a water fern unrecorded for central Arizona, grows profusely with duckweed (*Lemna* sp.) in the marsh.

Field work at Blue Point Cottonwoods has contributed much to our knowledge of birds in the central lowlands of Arizona. In the past, many important specimens and records were obtained from the area by Lyndon L. Hargrave, Allan R. Phillips, and Lewis D. Yaeger. Some of the more important records for the Salt River Valley include: the only specimens of the Ferruginous Owl (*Glaucidium brasilianum*) during this century (Hargrave; Phillips); the only specimen of the Common Crow (*Corvus brachyrhynchos*) (Phillips); the only Red-breasted Nuthatch (*Sitta canadensis*) specimens (Phillips and Yeager); the only nesting record of the Bewick's Wren (*Thryomanes bewickii*) (Phillips and Yeager); and the only Hutton's Vireo (*Vireo huttoni*) specimens (Phillips; Johnson and Simpson). The northernmost specimen for the Tropical Kingbird (*Tyrannus melancholicus*) was collected here by Simpson and Werner (Condor 60:68, 1958).

While the following species nest at one or two other localities in the Salt River Valley, Blue Point Cottonwoods and the nearby river is the only area left that is both large enough and stable enough to support them all: Green Heron (*Butorides virescens*), Yellow-billed Cuckoo (*Coccyzus americanus*), Bell's Vireo (*Vireo bellii*), Yellow Warbler (*Dendroica petechia*), Yellowthroat (*Goethlypis trichas*), Summer Tanager (*Piranga rubra*), and Blue Grosbeak (*Guiraca caerulea*). Considering the ephemeral nature of the other habitats, the loss of Blue Point Cottonwoods may also mean the loss of most or all these species as breeding birds in the Salt River Valley.

Our recent field work in this area has resulted in several additional distributional records of some interest. All specimens mentioned in the following species accounts are in the Johnson-Simpson-Werner (JSW) collection, now housed at Prescott College, Prescott, Arizona. Our thanks to Lyndon L. Hargrave and Allan R. Phillips for critical reading of the manuscript.

Least Bittern. *Ixobrychus exilis*. According to Phillips, Marshall, and Monson (The birds of Arizona. Univ. Arizona Press, Tucson. 1964. p. 7), the only previously documented nesting of this species in Arizona was by Simpson and Werner (loc. cit.). Our specimen (JSW no. 925) was collected on 9 July 1969 in a dense stand of cattails in the marsh. It is a juvenile female with down on the legs, wings, neck, and head, and was accompanied by one or two other juveniles, presumably nest mates, and at least one adult. At least one additional adult was seen. The nest was secured on 20 July 1969 and is the first nest from Arizona for this species.

Groove-billed Ani. *Crotophaga sulcirostris*. A female? (gonads shot), collected on 20 July 1969 (JSW no. 879) showed no fat and no molt. This is the second known extant specimen from the state (see Phillips et al., loc. cit.:46). Later, Bernard Roer informed us that he found another Groove-billed Ani at his bird farm in Phoenix on 11 July 1969 and donated it to the Phoenix Zoo.